

100

2

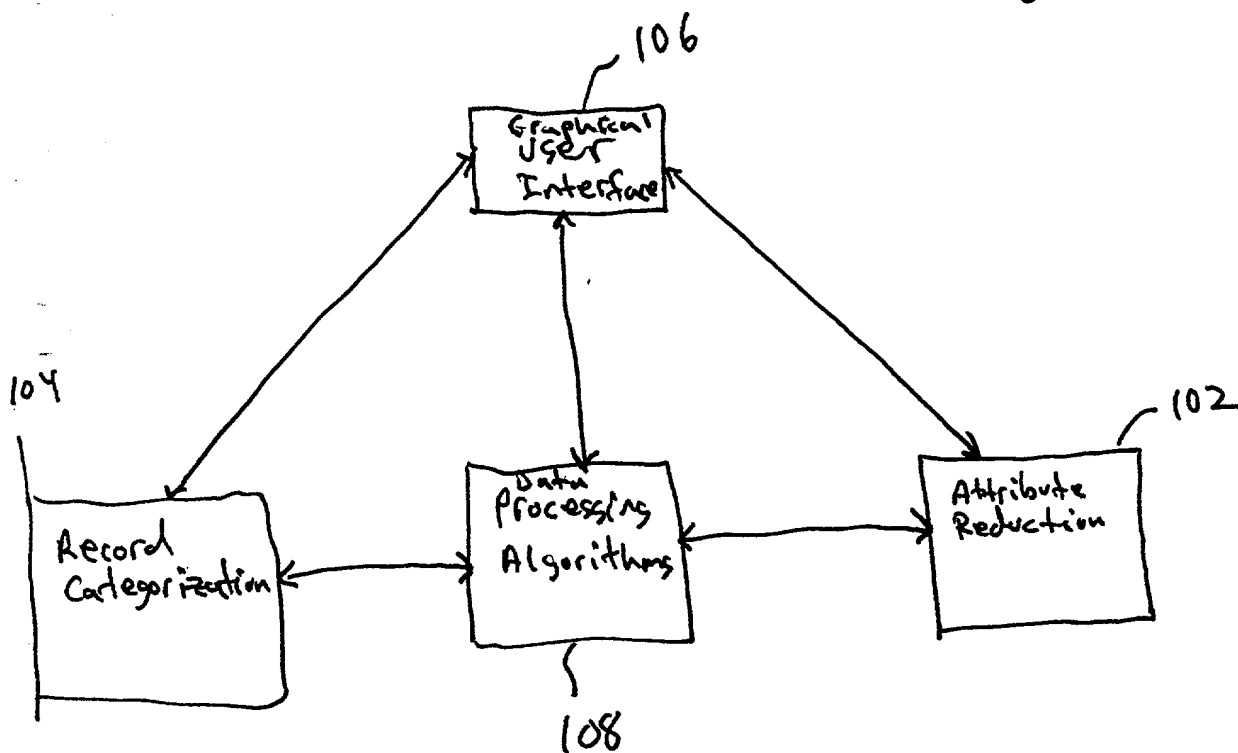


Figure 1

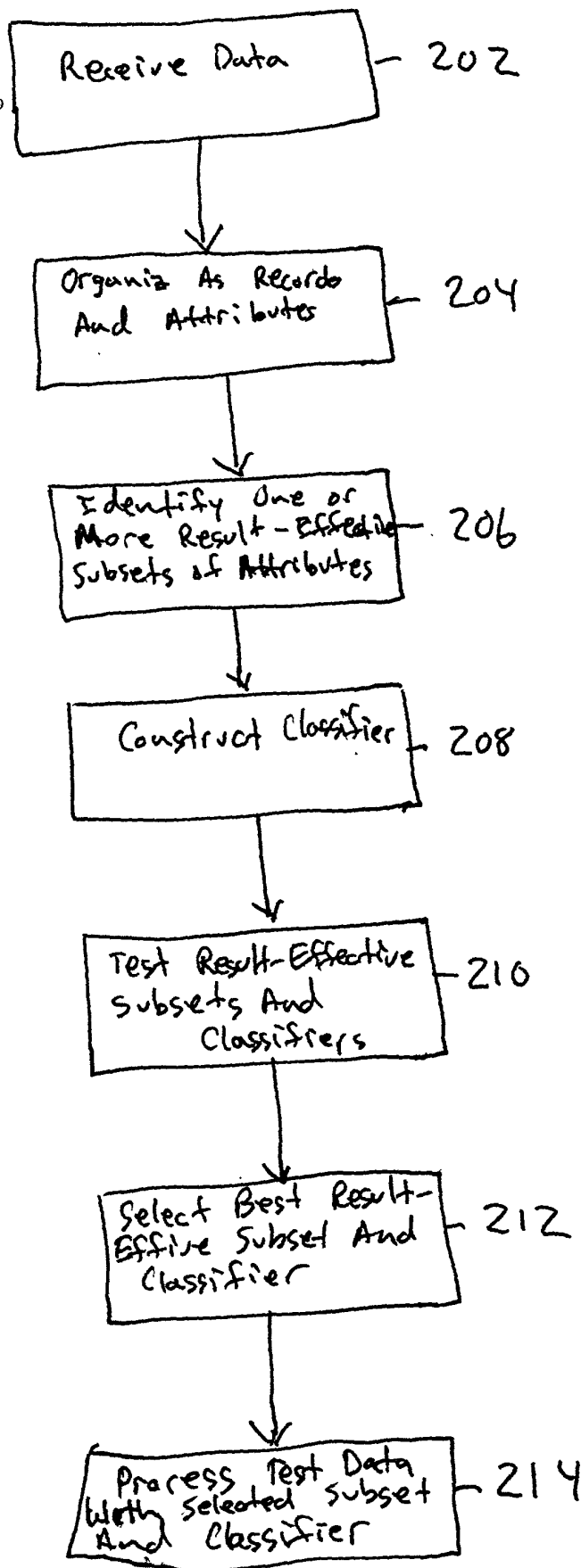


Figure 2

2218917

304

Record 1

308

Record n

306

302

Variable 16	
Variable 15	
Variable 14	
Variable 13	
Variable 12	
Variable 11	
Variable 10	
Variable 9	
Variable 8	
Variable 7	
Variable 6	
Variable 5	
Variable 4	
Variable 3	
Variable 2	
Variable 1	

Figure 3

304

205F20" 469400F

# Variable 4

404

400

308

Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	Variable 6	Variable 7	Variable 8	Variable 9	Variable 10	Variable 11	Variable 12	Variable 13	Variable 14	Variable 15	Variable 16
B	D	F	20.80	86	B	1.98	1.60	A	0.30	1.53	1.95	0.95	3.33	495	
A	A	B	16.00	96	D	2.65	2.33	A	0.26	1.98	4.70	1.04	3.59	1035	
B	D	F	19.00	92	B	2.36	2.04	A	0.39	2.08	2.70	0.86	3.02	312	
A	A	A	18.60	101	C	2.80	3.24	B	0.30	2.81	5.68	1.03	3.17	1185	
A	A	B	22.50	101	C	3.00	3.25	A	0.29	2.38	5.70	1.19	2.71	1285	
B	D	E	22.00	86	B	1.45	1.25	A	0.50	1.63	3.60	1.05	2.65	450	
B	D	F	19.00	80	B	1.65	2.03	B	0.37	1.63	3.40	1.00	3.17	510	
A	A	B	18.00	98	C	2.45	2.43	A	0.29	1.44	4.25	1.12	2.51	1105	
A	B	C	17.20	94	C	2.45	2.99	A	0.22	2.29	5.60	1.24	3.37	1265	
B	D	F	21.00	85	B	2.60	2.65	B	0.37	1.35	2.76	0.86	3.28	378	

LOW HIGH

Figure 4A

2218917

306

402a 402b 402c

402

# Variable 2

Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	Variable 6	Variable 7	Variable 8	Variable 9	Variable 10	Variable 11	Variable 12	Variable 13	Variable 14	Variable 15	Variable 16
B	D	F	1.99	20.80	86	B	1.98	1.60	A	0.30	1.53	1.95	0.95	3.33	495
A		B	2.21	16.00	96	D	2.65	2.33	A	0.26	1.98	4.70	1.04	3.59	1035
B	D	F	1.94	19.00	92	B	2.36	2.04	A	0.39	2.08	2.70	0.86	3.02	312
A		A	2.67	18.60	101	C	2.80	3.24	B	0.30	2.81	5.68	1.03	3.17	1185
A		B	2.70	22.50	101	C	3.00	3.25	A	0.29	2.08	5.70	1.19	2.71	1285
B	D	E	2.42	22.00	86	B	1.45	1.25	A	0.50	1.63	3.60	1.05	2.65	450
B	D	F	2.12	19.00	80	B	1.65	2.03	B	0.37	1.63	3.40	1.00	3.17	510
A		B	2.55	18.00	98	C	2.45	2.43	A	0.29	1.44	4.25	1.12	2.51	1105
A		C	2.60	17.20	94	C	2.45	2.99	A	0.22	2.29	5.60	1.24	3.37	1265
B	D	F	2.17	21.00	85	B	2.60	2.65	B	0.37	1.36	2.76	0.86	3.28	378

LOW HIGH

402a 402b 402c

Figure 4B

2218917

All Columns

400

308

LOW HIGH

402

402a 402b 402c

Figure 4C

306

2218917

Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	Variable 6	Variable 7	Variable 8	Variable 9	Variable 10	Variable 11	Variable 12	Variable 13	Variable 14	Variable 15	Variable 16
B	D	F													
20.80	2.21	2.65	2.33	1.30	1.53	1.98	2.70	2.38	2.32	1.93	1.05	3.63			
18.00	2.67	2.80	3.24	0.39	2.08	2.81	2.32	2.45	2.43	2.99	2.65	3.59	1035		
19.00	2.70	2.86	3.25	0.50	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.02			
18.60	2.42	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17	1185		
22.60	2.55	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			
22.00	2.60	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			
19.00	2.60	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			
18.00	2.60	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			
17.20	2.60	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			
21.00	2.60	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			
21.00	2.60	2.60	3.00	0.37	1.63	2.38	2.45	2.45	2.45	2.45	2.45	3.17			

304

FIG. 4D

Completed view  
 with numbers  
 removed

400

308

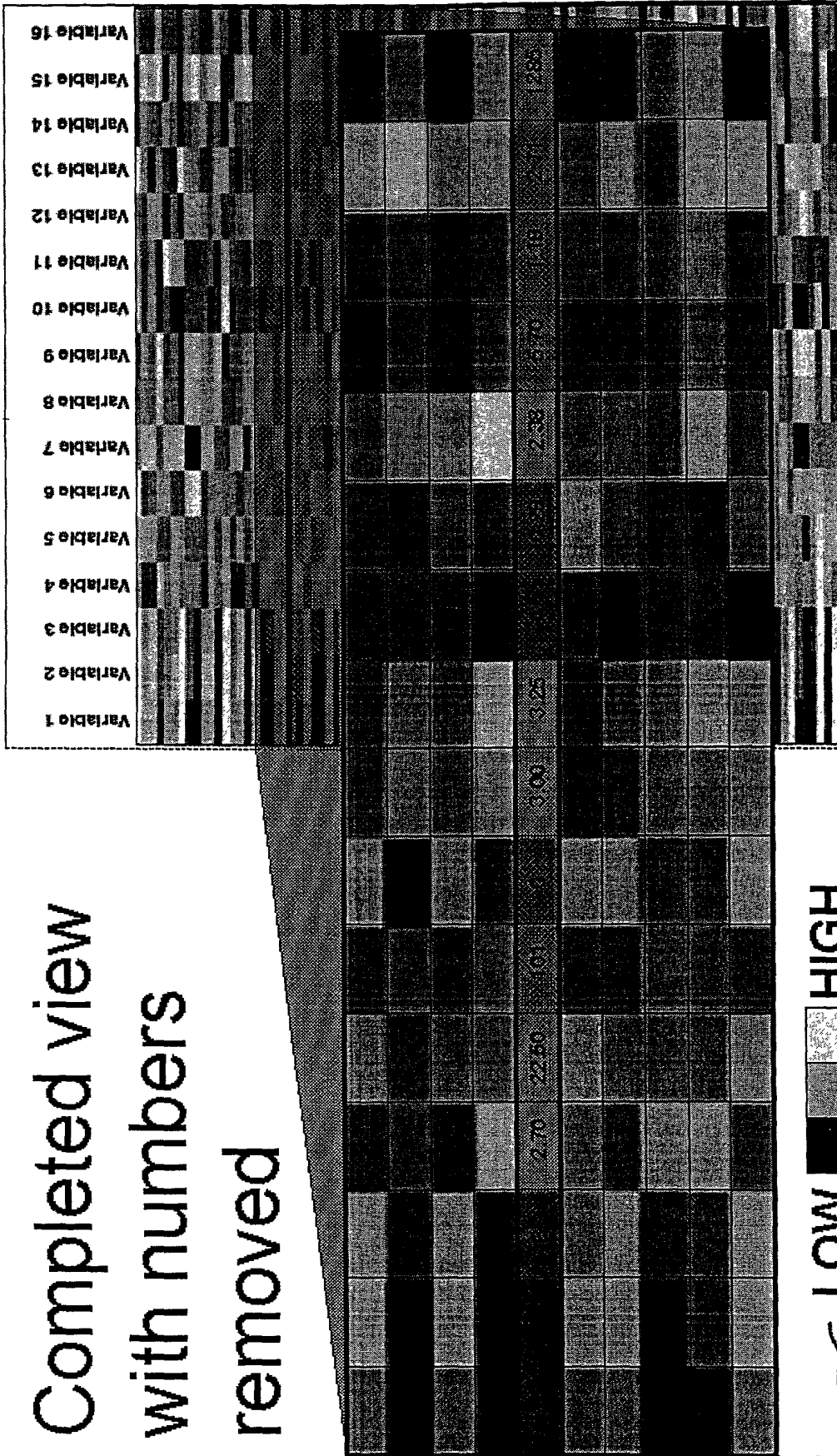


Figure 4D

2218917

# Ideal Case

## Random

500

502

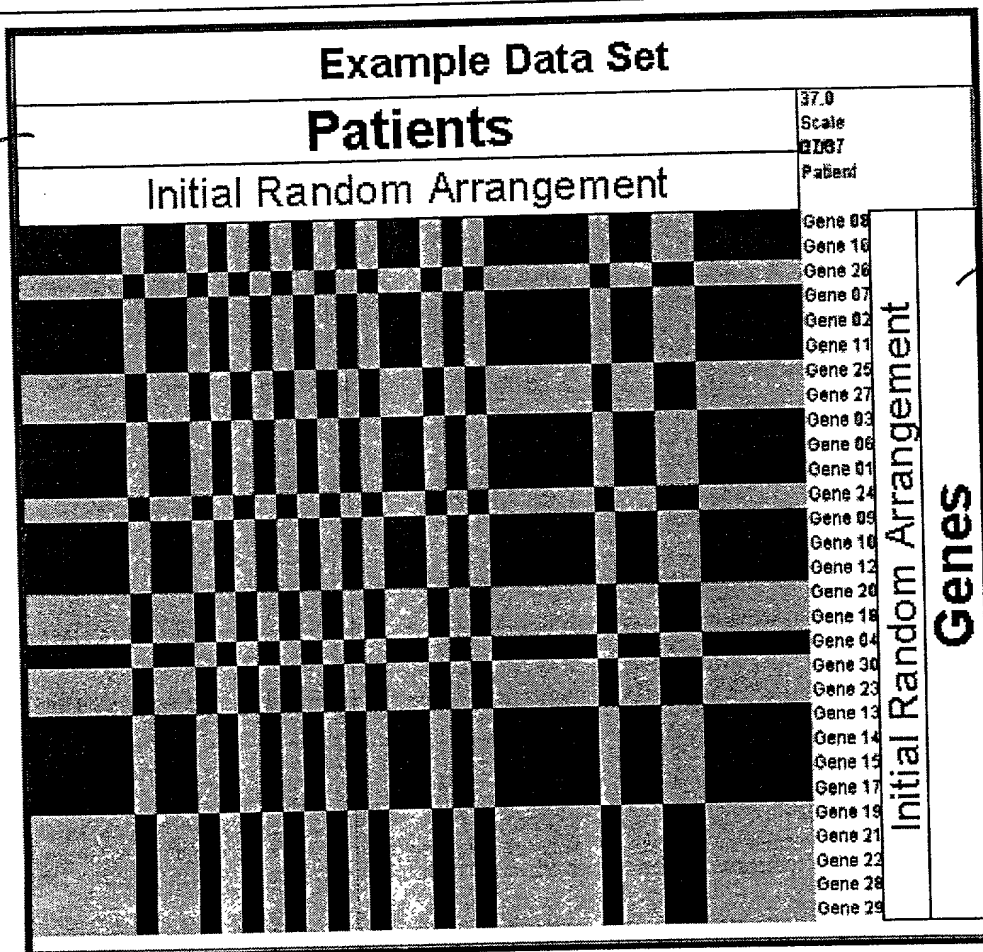


Figure 5A

# Ideal Case

## Sorted by Patients

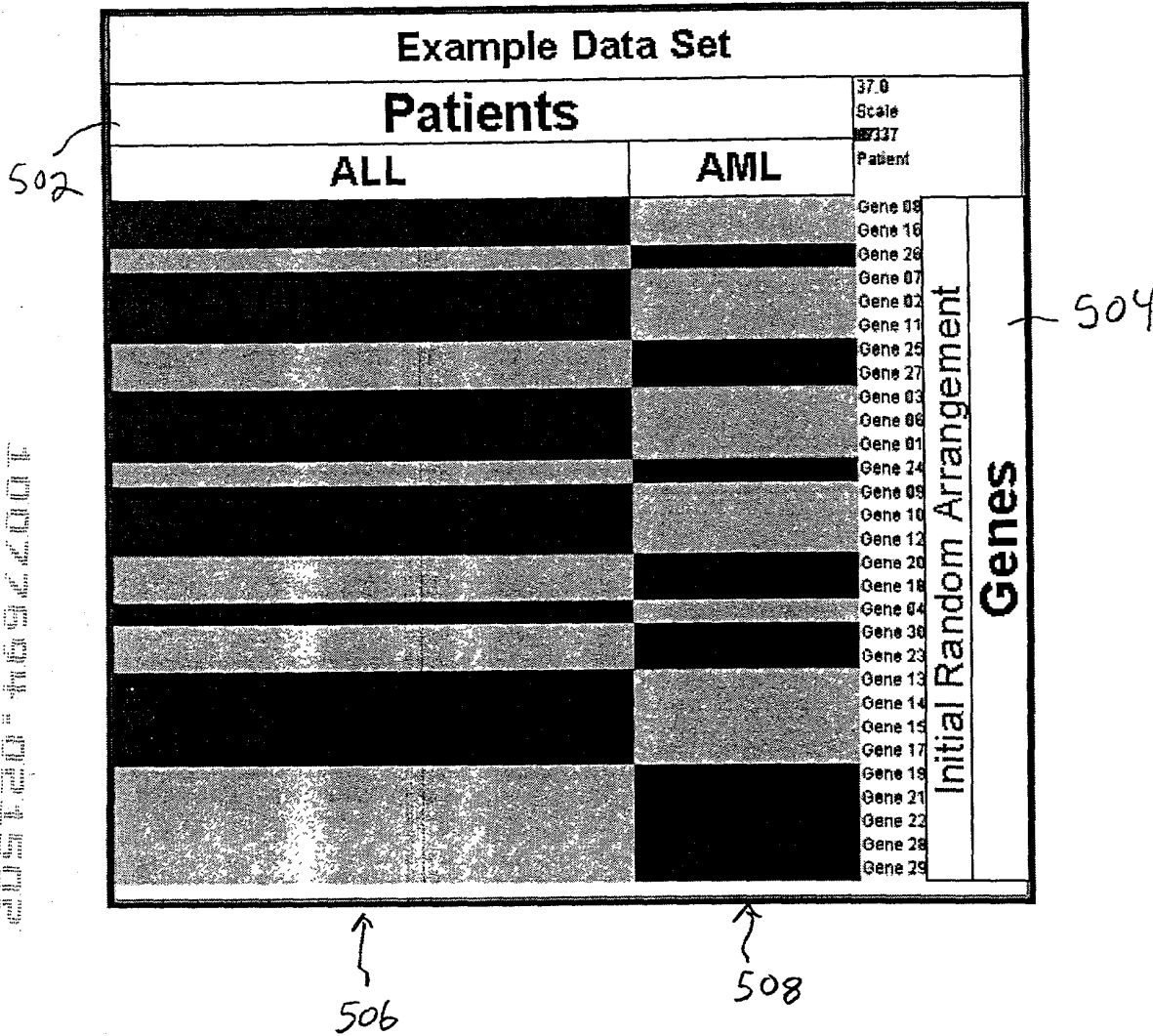


Figure 5B

2218917

# Ideal Case

## Grouped on Genes

500

502

Example Data Set		
Patients		37.0 Scale
ALL	AML	137 Patient
		Gene 01
		Gene 02
		Gene 03
		Gene 04
		Gene 05
		Gene 06
		Gene 07
		Gene 08
		Gene 09
		Gene 10
		Gene 11
		Gene 12
		Gene 13
		Gene 14
		Gene 15
		Gene 16
		Gene 17
		Gene 18
		Gene 19
		Gene 20
		Gene 21
		Gene 22
		Gene 23
		Gene 24
		Gene 25
		Gene 26
		Gene 27
		Gene 28
		Gene 29
		Gene 30

Group by Distinguishing Classes

Genes

510

512

506

508

Figure 5C

2218917

5 C

# Random

600

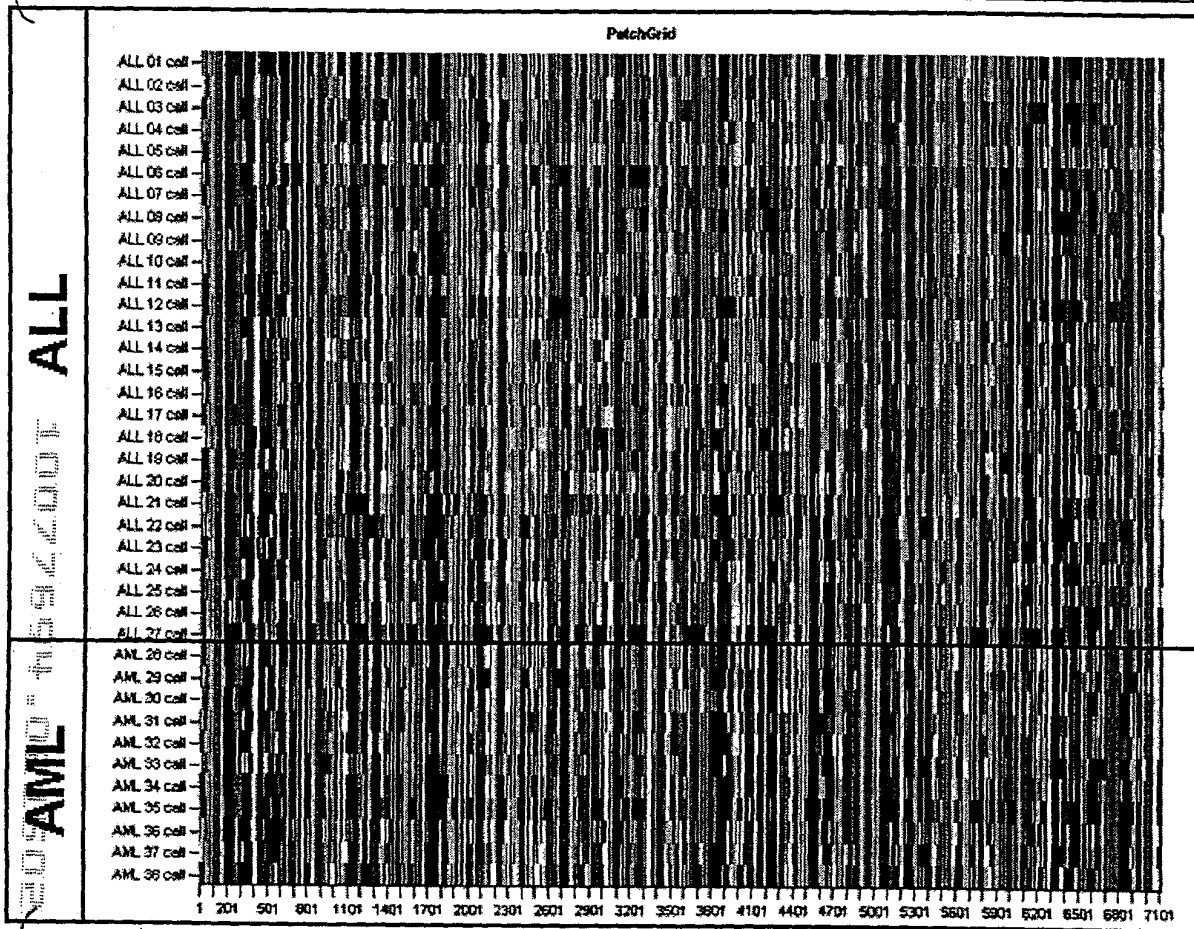


Figure 6A

2218917

# Sort 1<sup>st</sup> Dimension

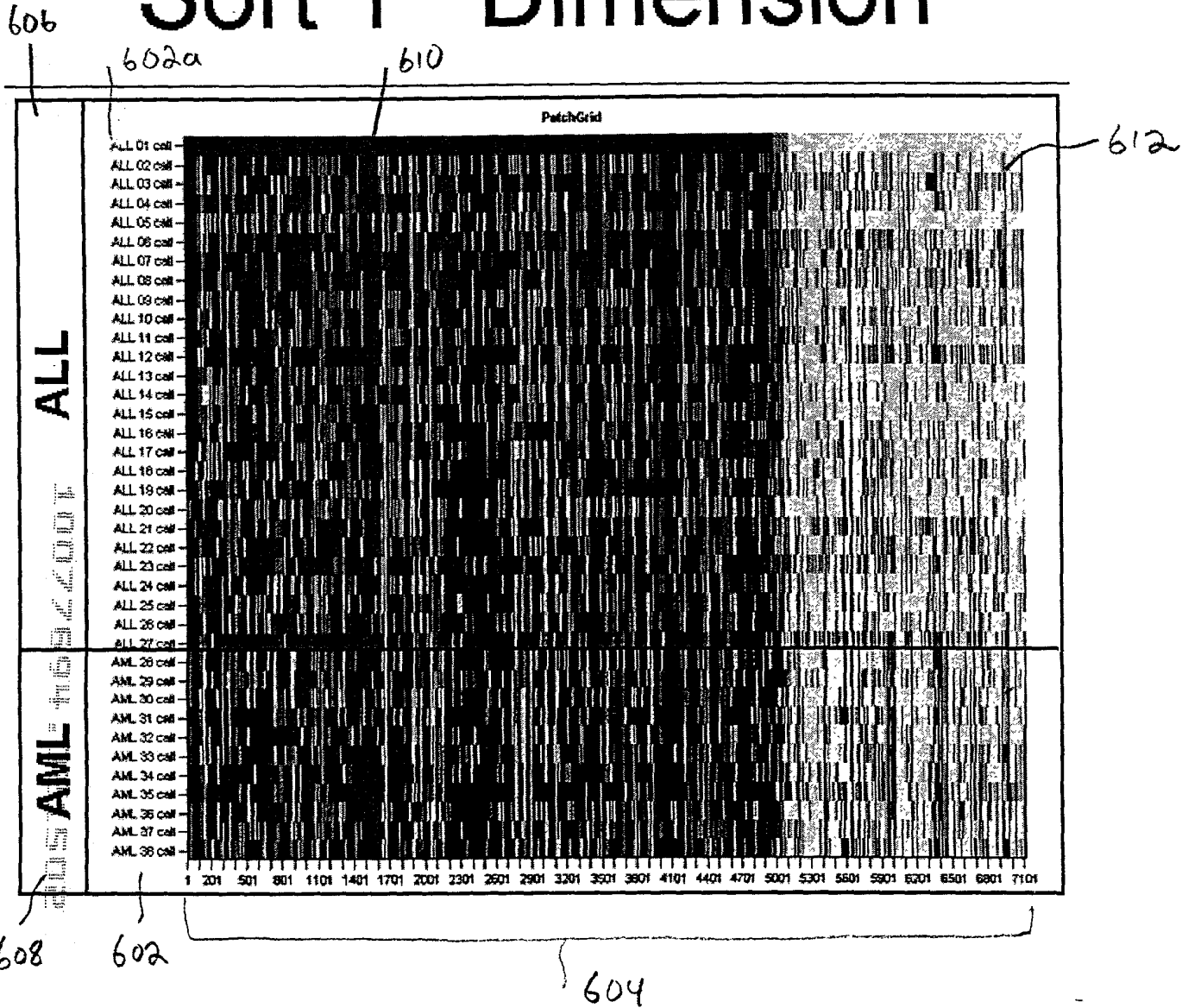


Figure 6B

2218917

600

# Sort 2<sup>nd</sup> Dimension

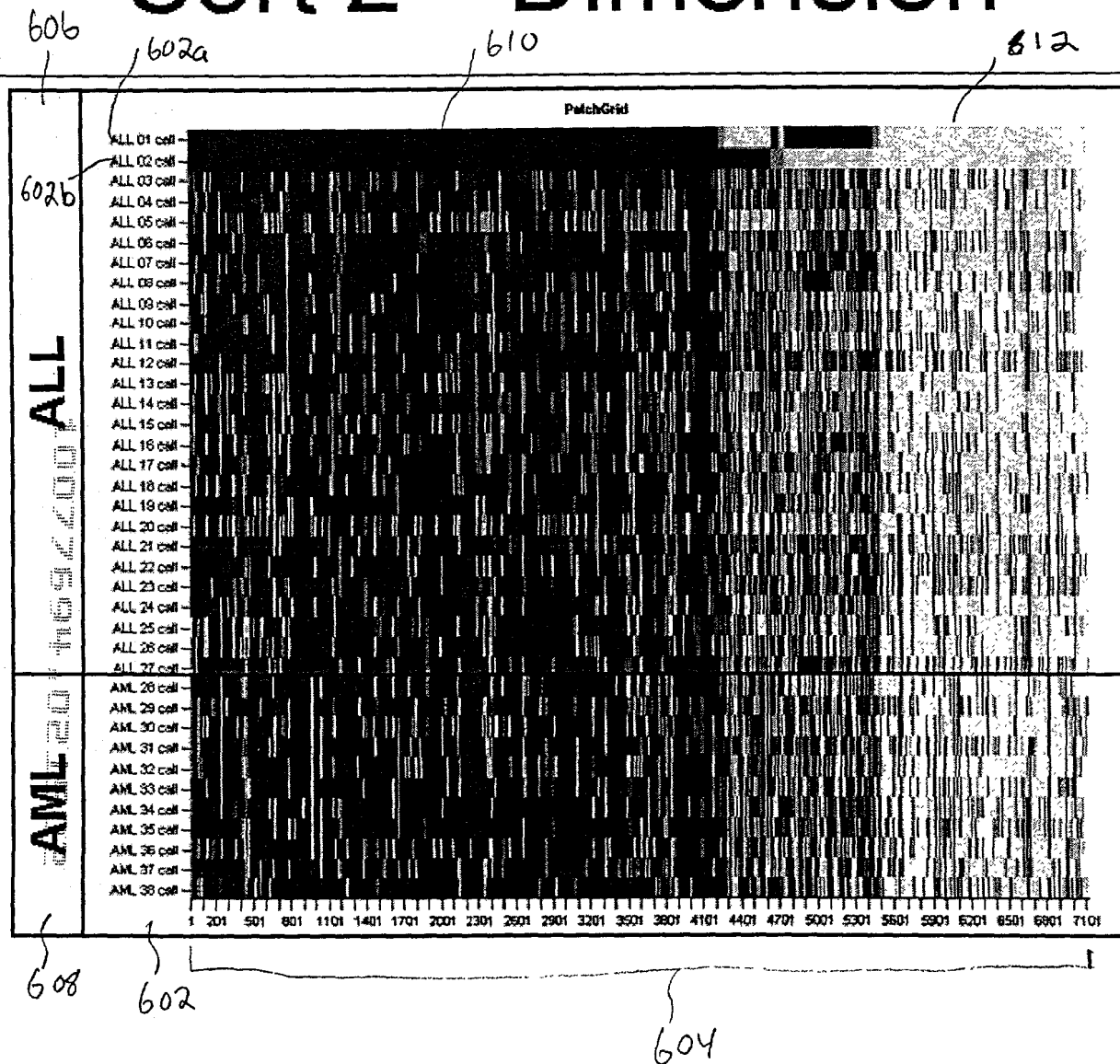


Figure 6C

2218917

6C

# Sorted 5 Dimensions

600

606

610

612

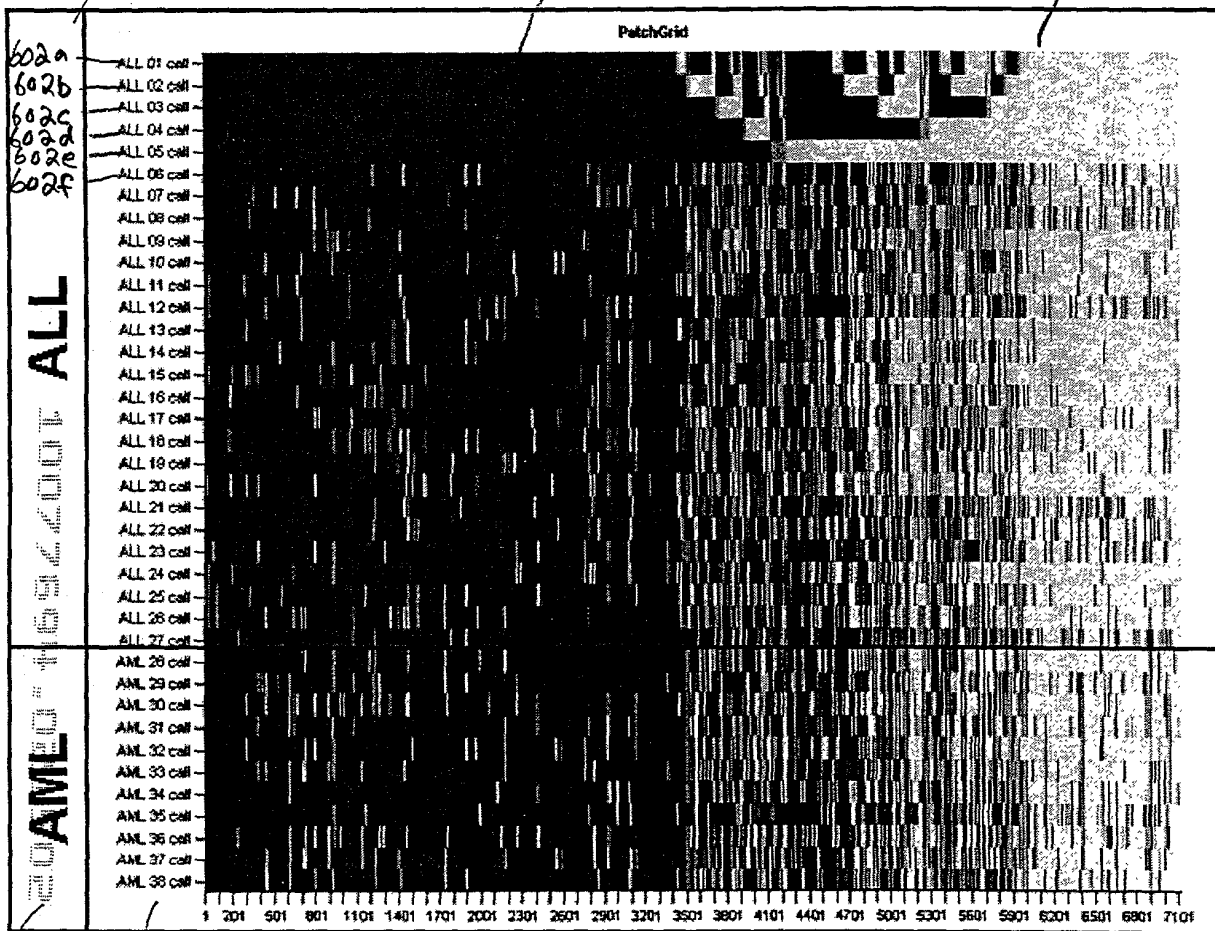


Figure 6D

2218917

6D

# Sorted 33 Dimensions

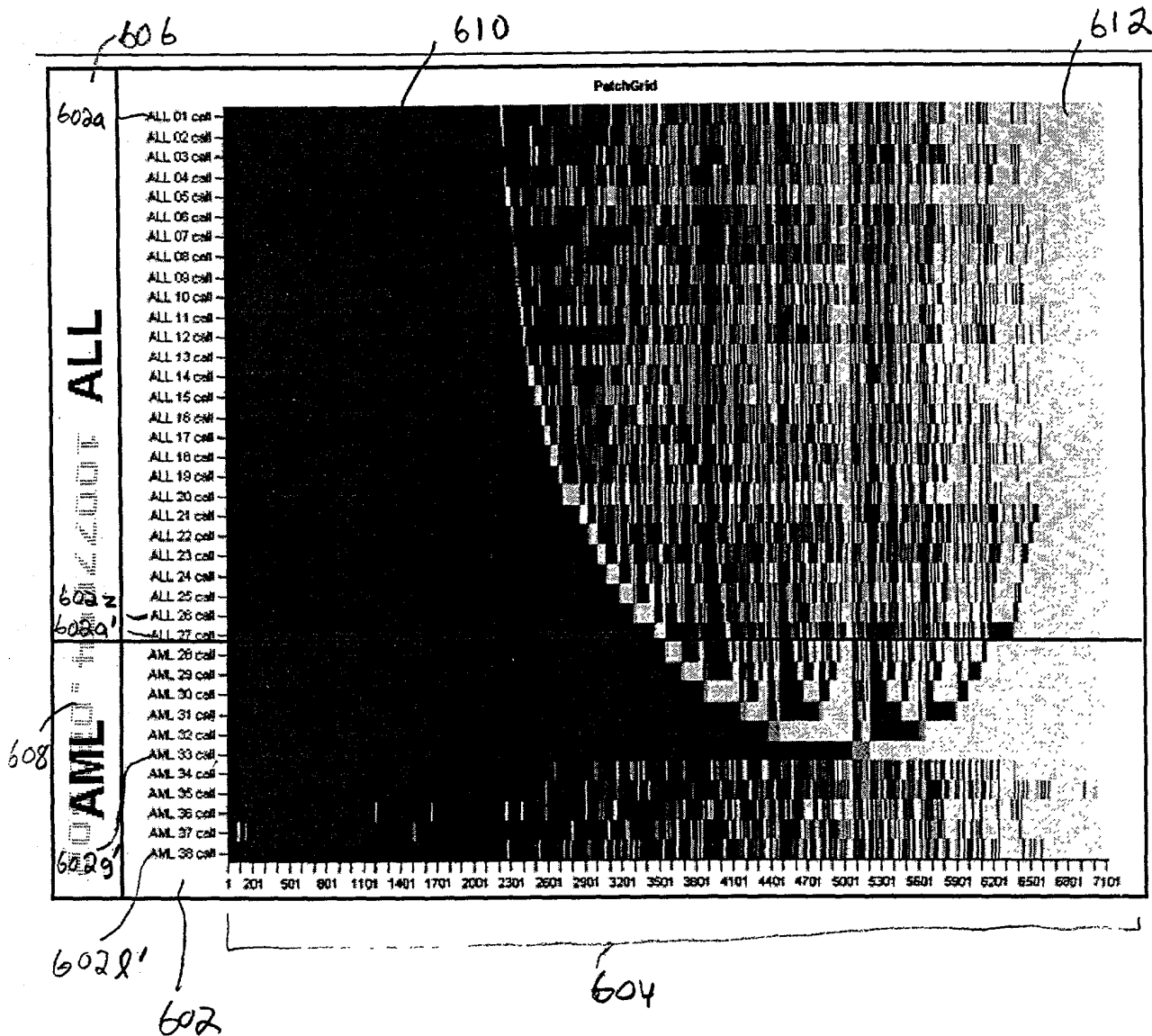


Figure 6E

2218917

# All Dimensions Sorted

600

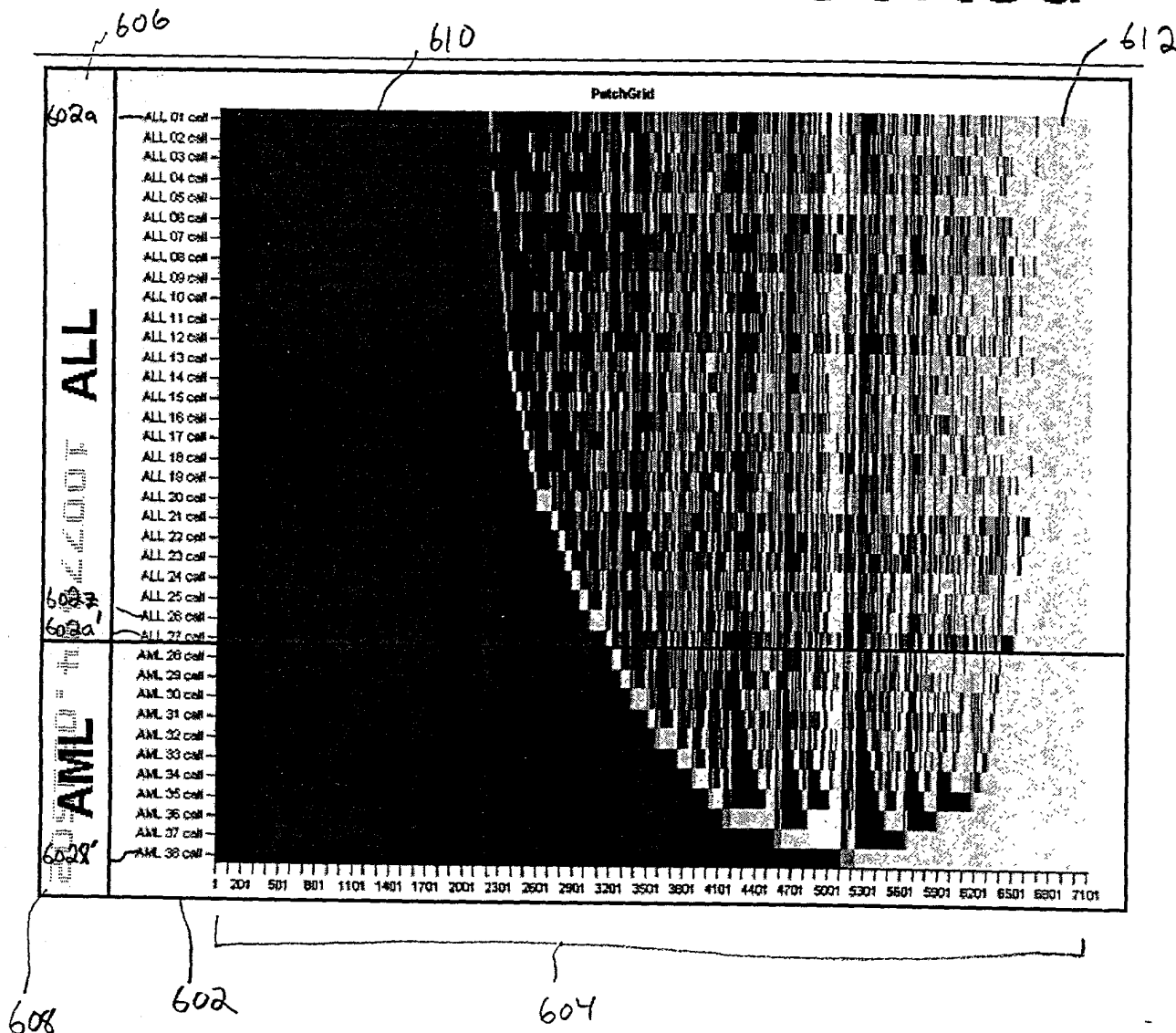


Figure 6F

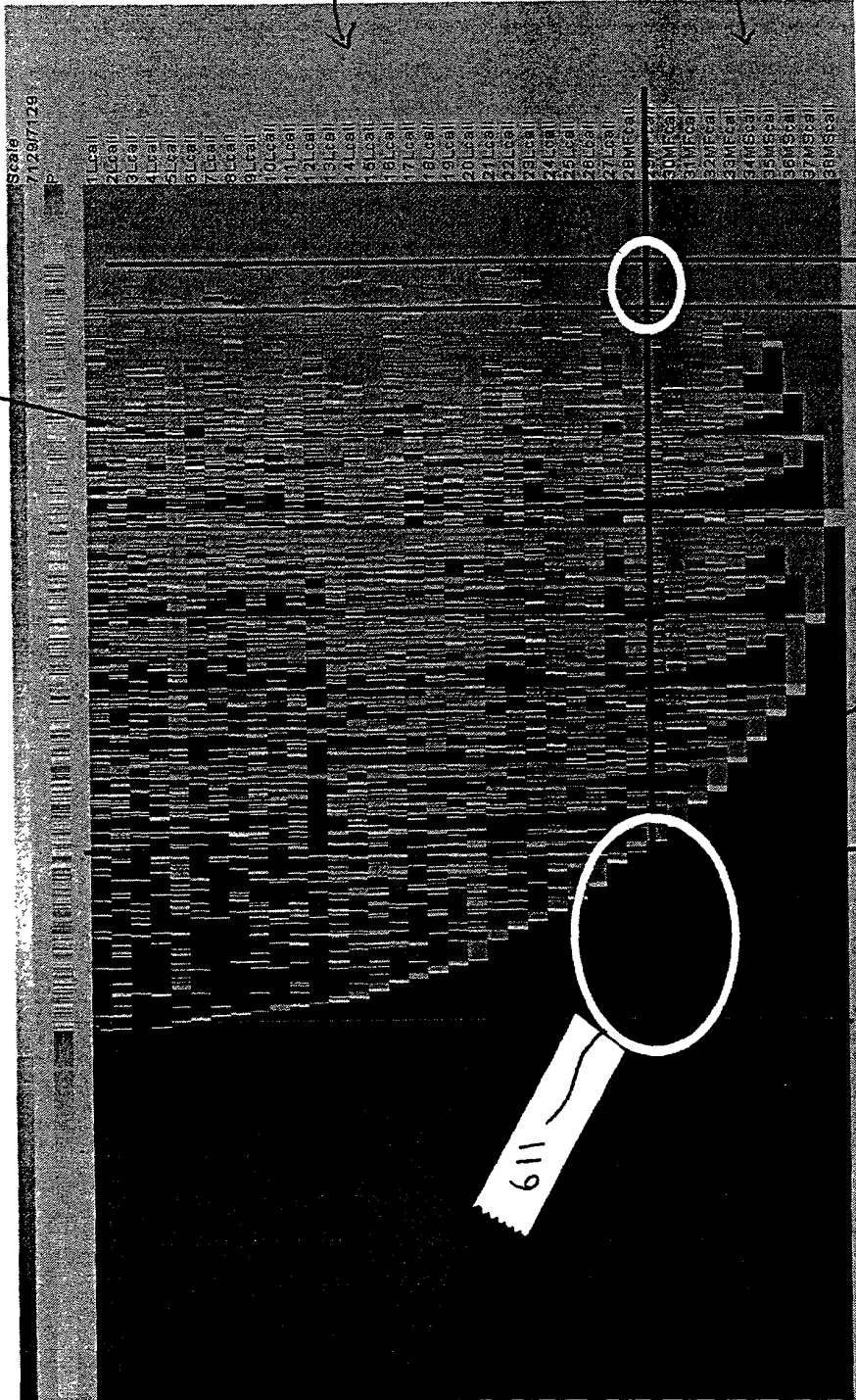
2218917

6F

600

205120" 46342001

634



618

Figure 6G

2271828-1



# Principal Uncorrelated Record Selection

**Training Data Set**

File Display Mapping Layout Selection Data

**Mark Related Records**

PUR Selection 702

start threshold 0.5 range(1,1)

adjust increment 0.0 704

final record count 10 706

Selects records that do not correlate highly with the currently marked records. If no records are marked, all records correlating with any other records will be marked.

OK Cancel

700

708

710

ALL 1

ALL 2

ALL 3

ALL 4

ALL 5

ALL 6

ALL 7

ALL 8

ALL 9

ALL 10

ALL 11

ALL 12

ALL 13

ALL 14

ALL 15

ALL 16

ALL 17

ALL 18

ALL 19

ALL 20

ALL 21

ALL 22

ALL 23

ALL 24

ALL 25

ALL 26

ALL 27

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ALL 84

ALL 85

ALL 86

ALL 87

ALL 88

ALL 89

ALL 90

ALL 91

ALL 92

ALL 93

ALL 94

ALL 95

ALL 96

ALL 97

ALL 98

ALL 99

ALL 100

Figure 7

800

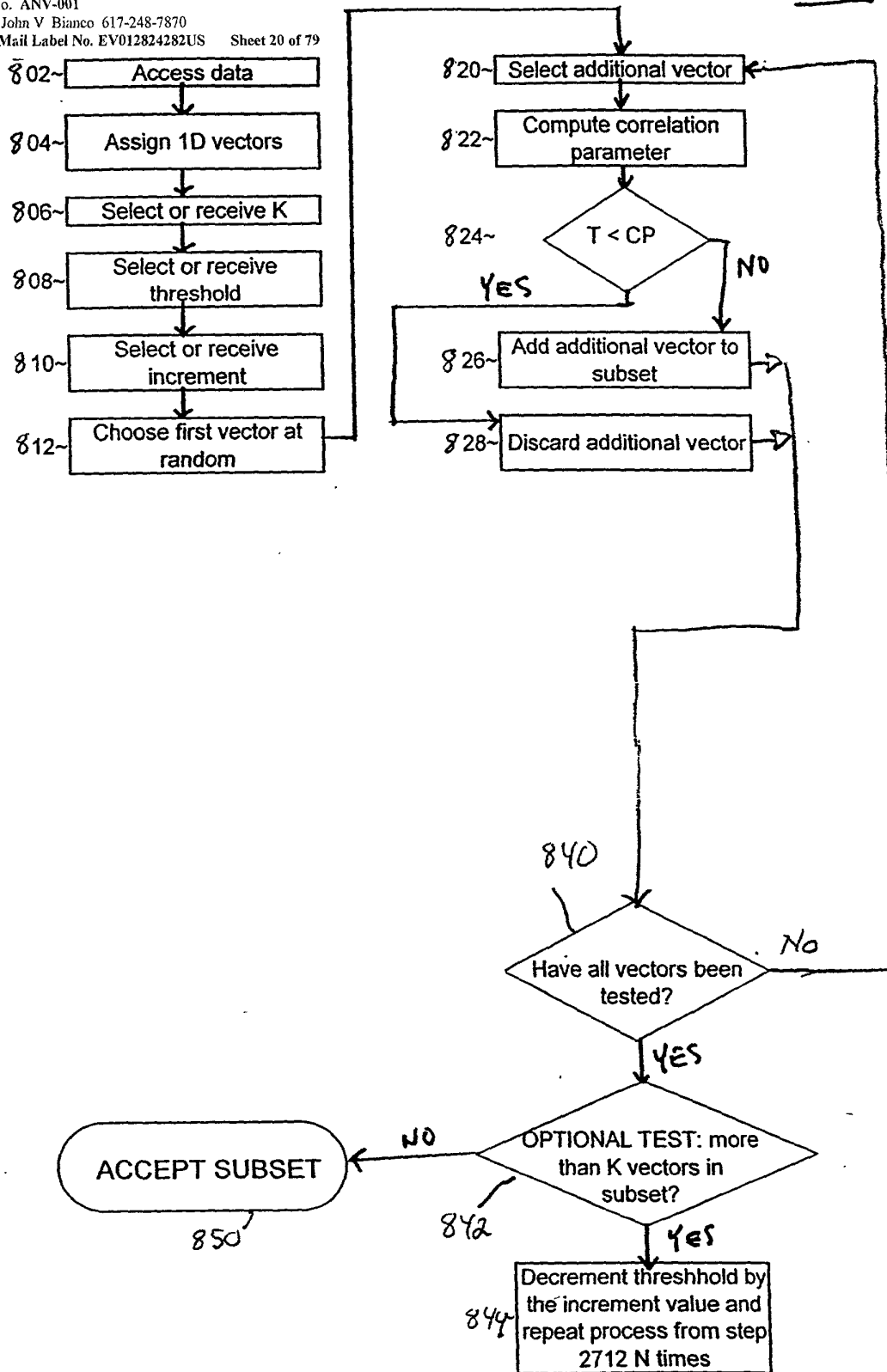


Figure 8.

205120-16924001

2268-791

255544

2007-05-24

# 76 Principal Uncorrelated Genes

Title: Method And System For Data Analysis  
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Docket No. ANV-001  
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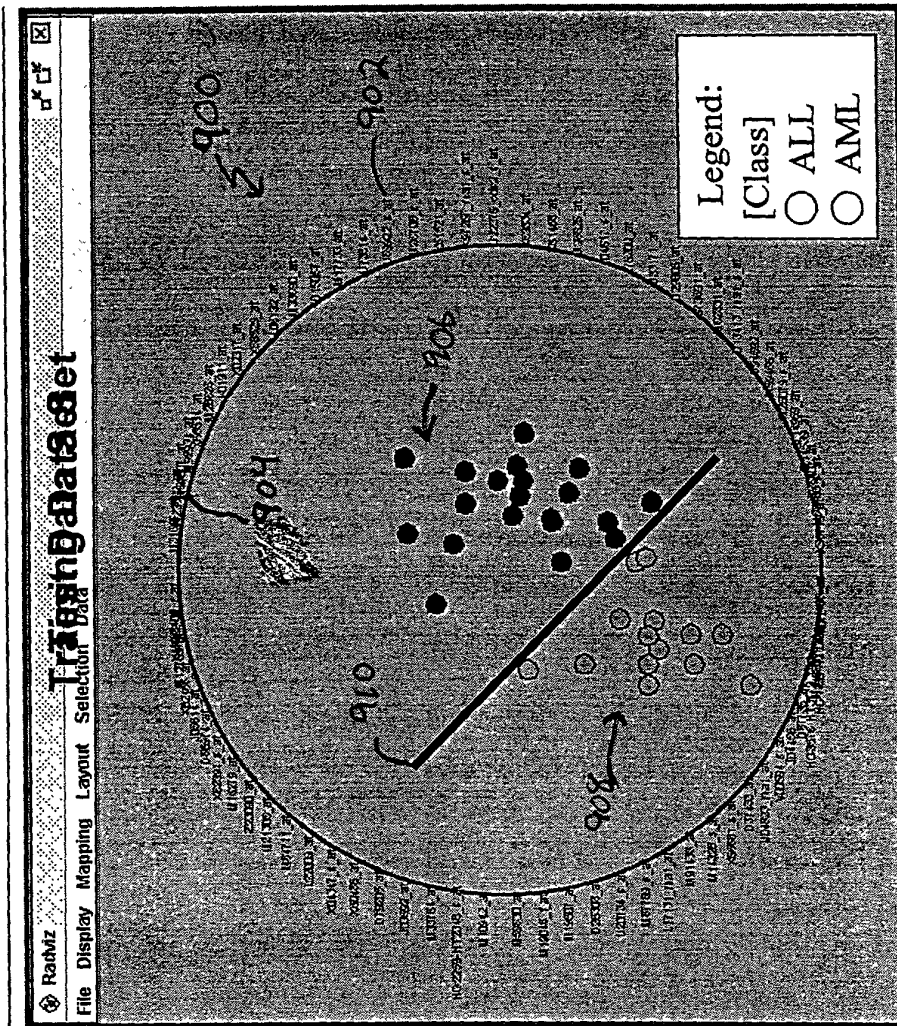
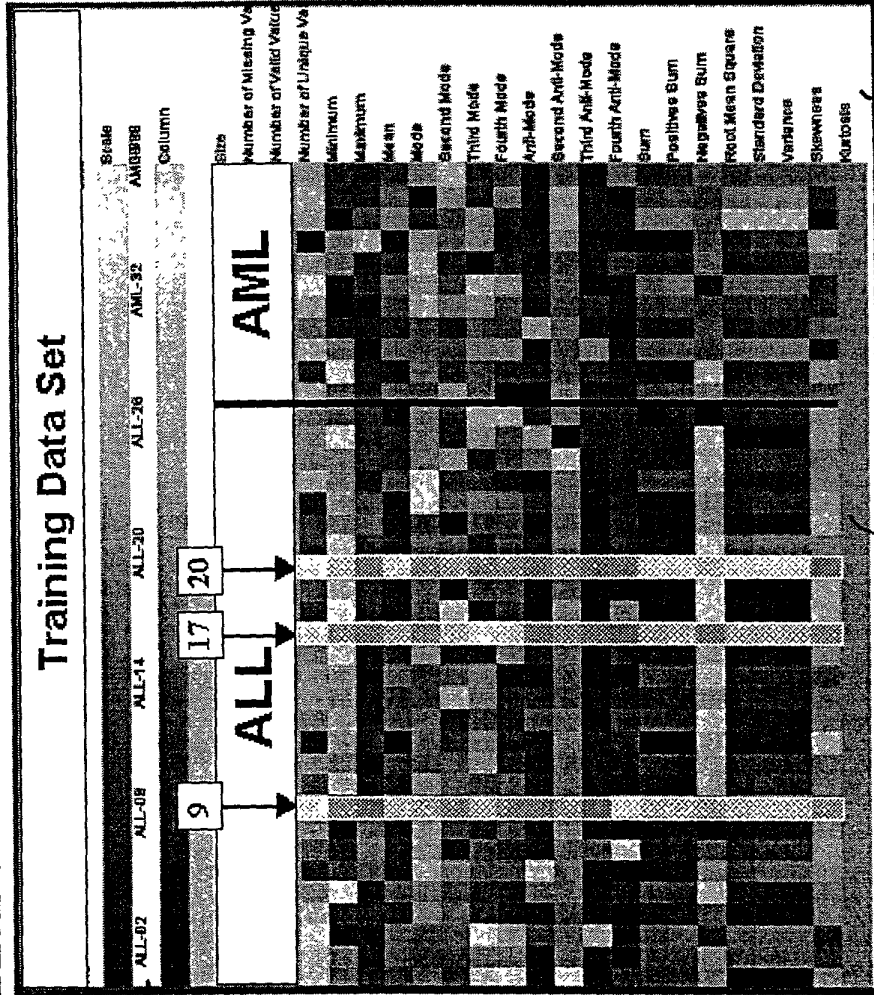


Figure 9

# Statistical Metadata

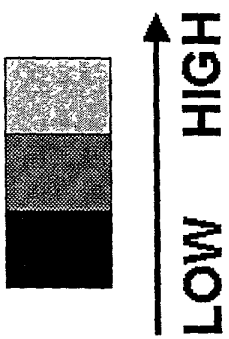
## (Affymetrix Absolute Data)

1000



602

1008



1004

Figure 10A

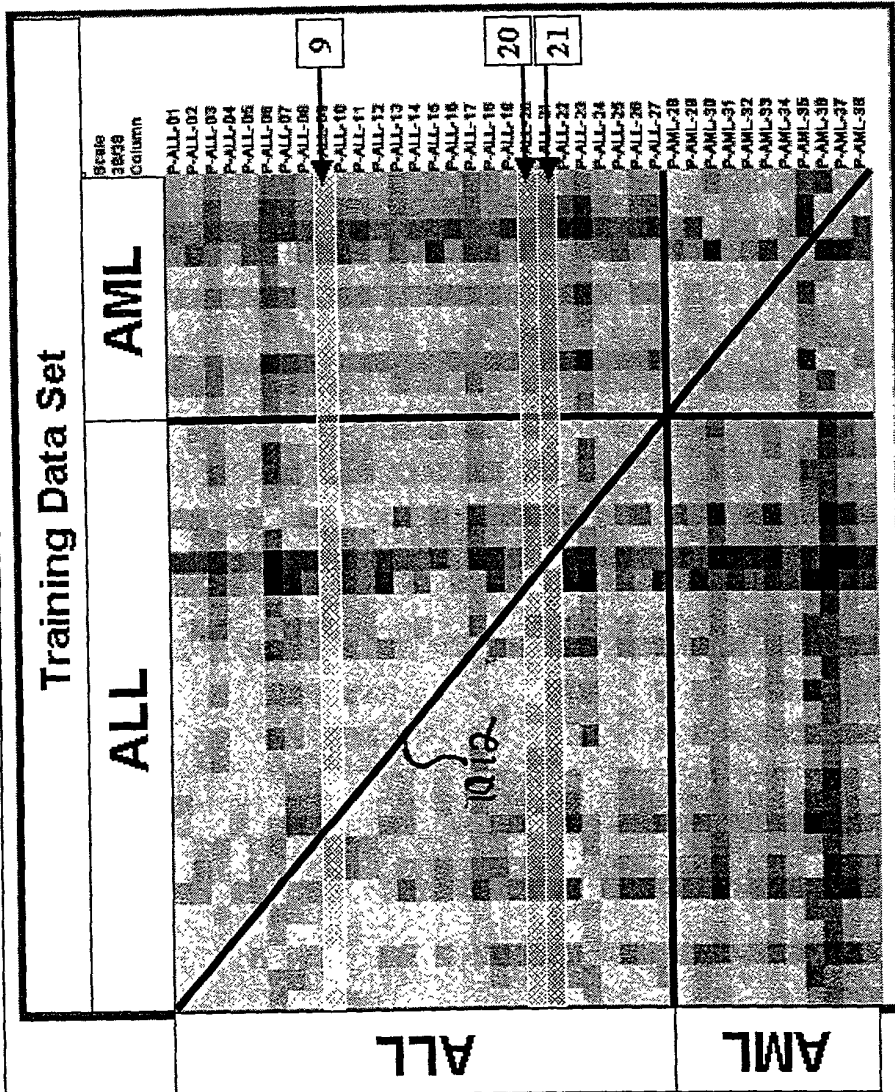
1002

205120-46942001

# Pearson Correlation Coefficients

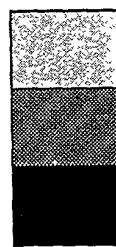
(Affymetrix Absolute Data)

1001



(38 x 38)

1010



-1 0 +1

Figure 103

2218917

205120 1694007

# Pearson Correlation Coefficients (Affymetrix Comparative Data)

1003

2

Title: Method And System For Data Analysis  
Inventor(s): Gee et al.  
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Docket No. ANV-001  
Contact: John V. Bianco 617-248-7870  
Express Mail Label No. EV012824282US Sheet 24 of 79

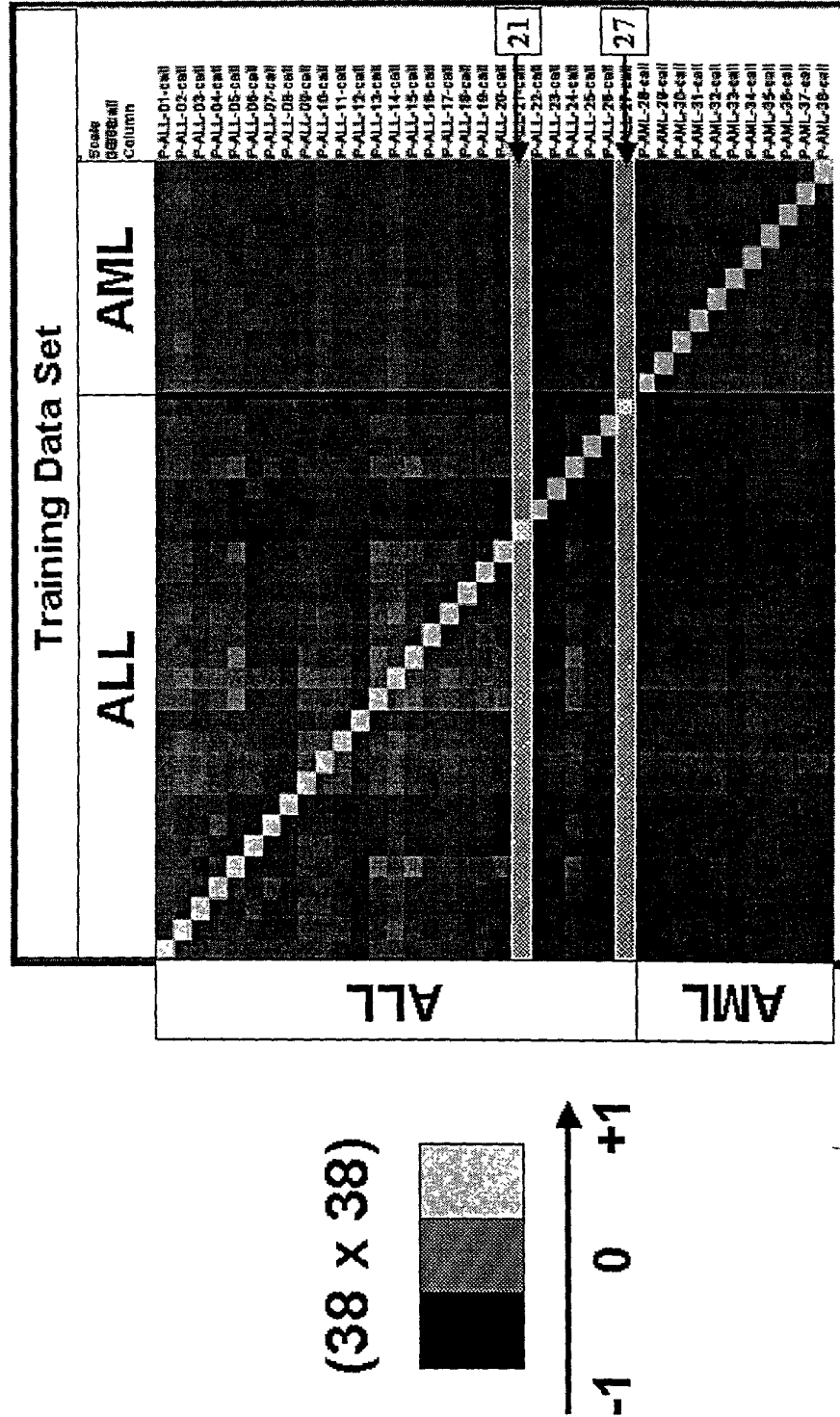


Figure 10C

2218917

# Final Result

Example Record 20

A	A	B	27.0	22.50	101	C	3.00	3.25	A	0.28	2.88	5.70	11.19	2.71	1285	Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	Variable 6	Variable 7	Variable 8	Variable 9	Variable 10	Variable 11	Variable 12	Variable 13	Variable 14	Variable 15	Variable 16

Figure 11A

10077694-021502

2218917

306

1100

205F20 4592200F

306

# Sort - Variable 1

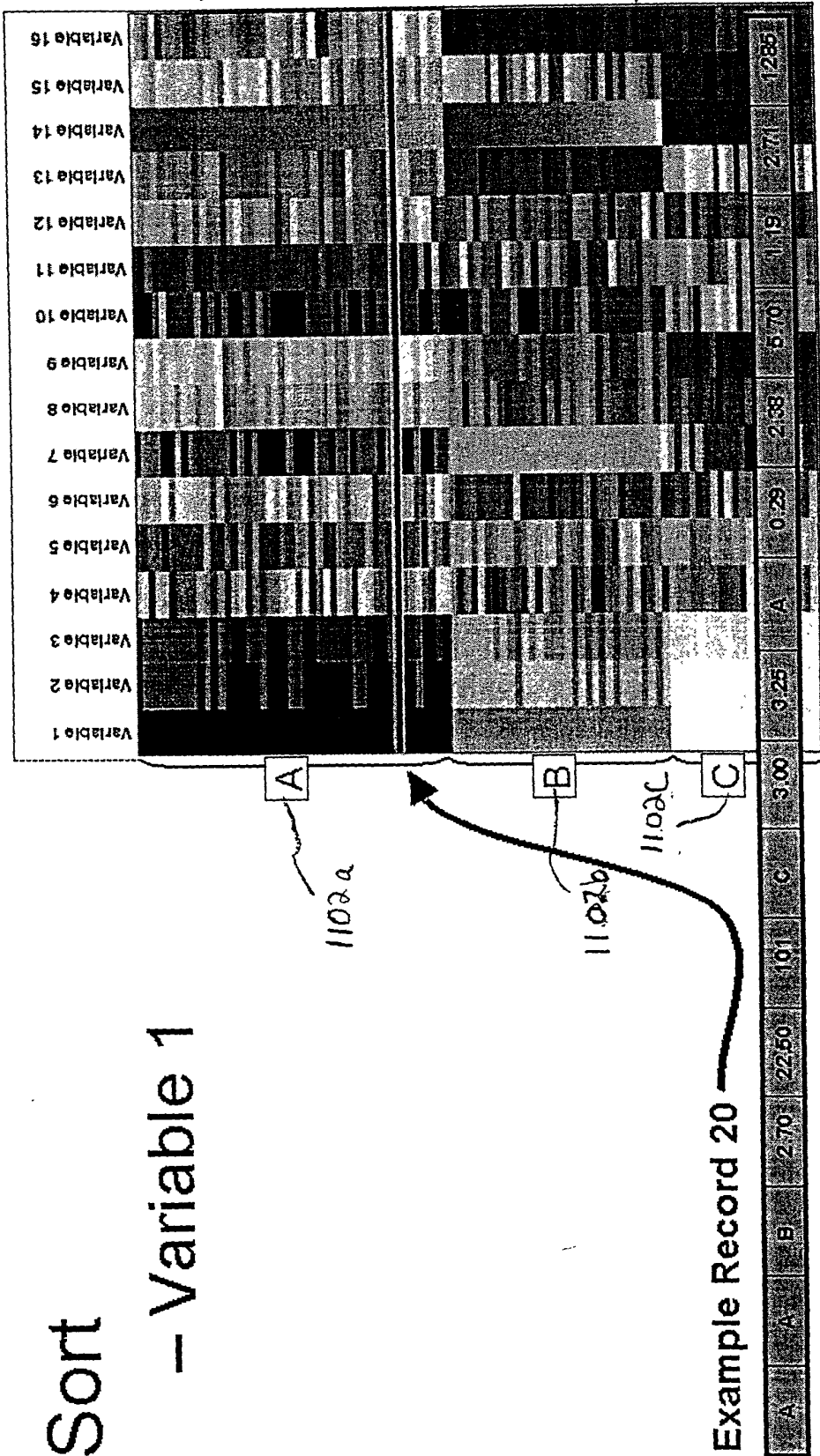
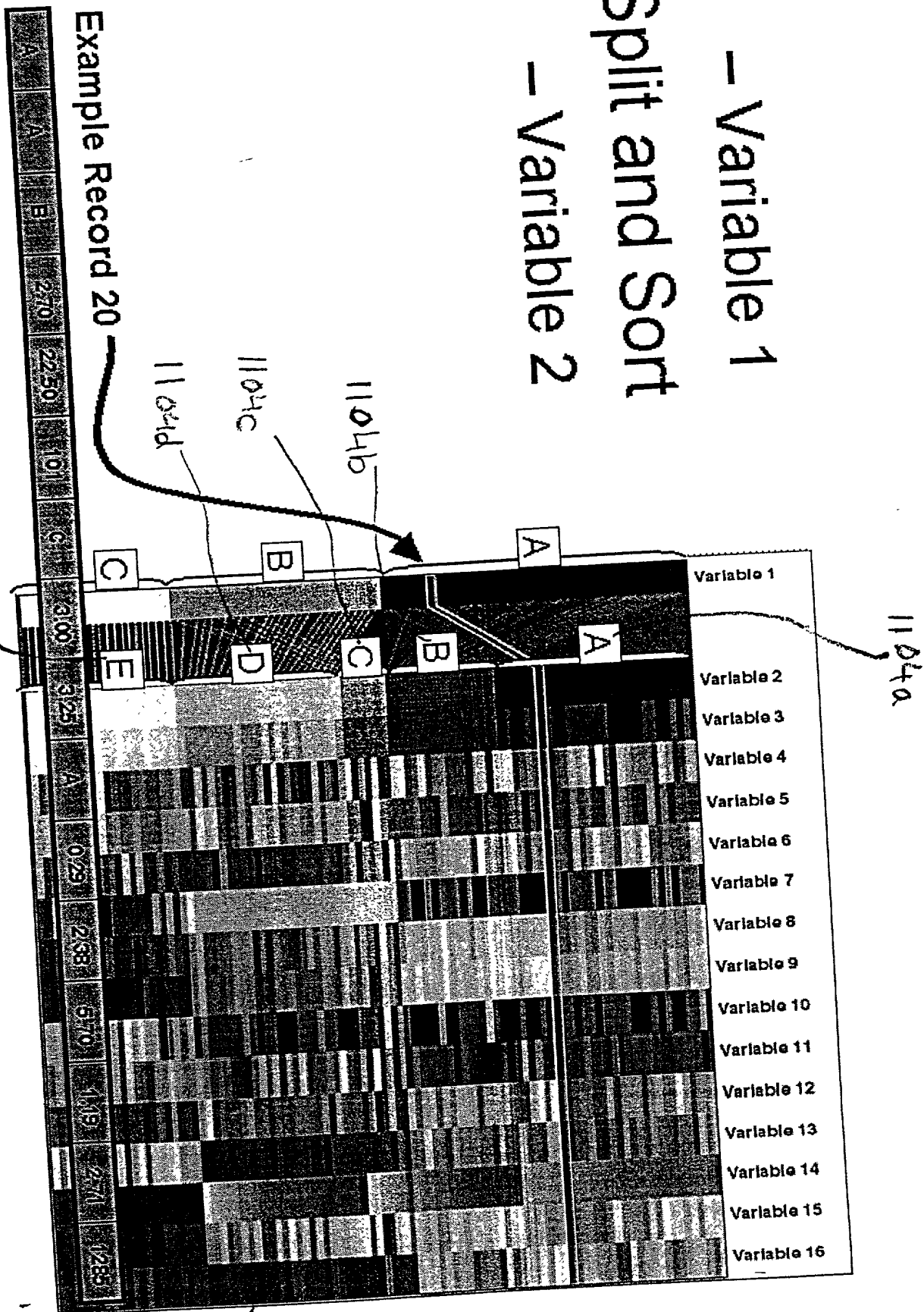


Figure 11B

2218917

# – Variable 1 – Variable 2 Split and Sort



1104e Figure 11C

2218917

366

# – Variable 1 – Variable 2 Split and Sort – Variable 3

Example Record 20

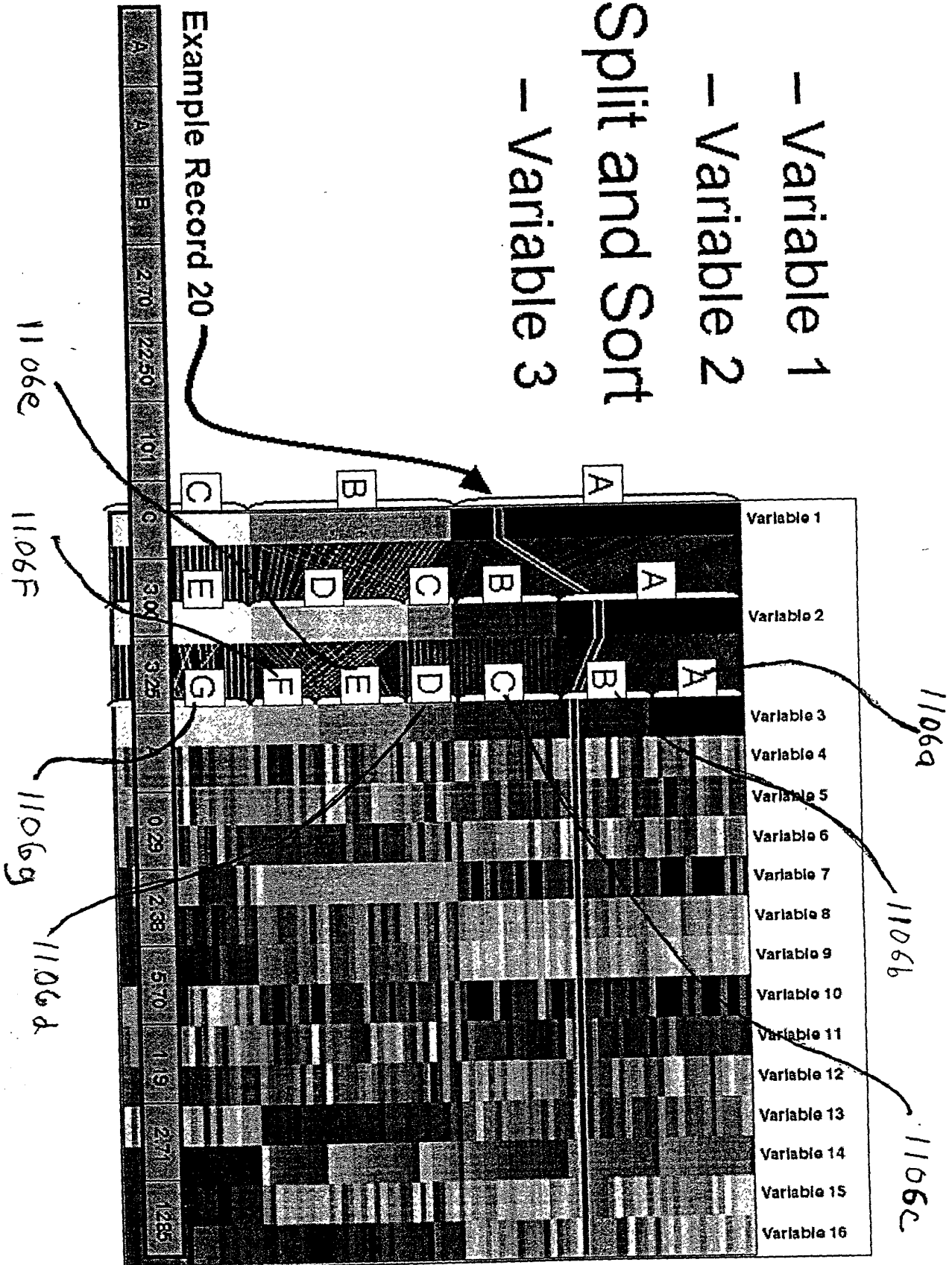
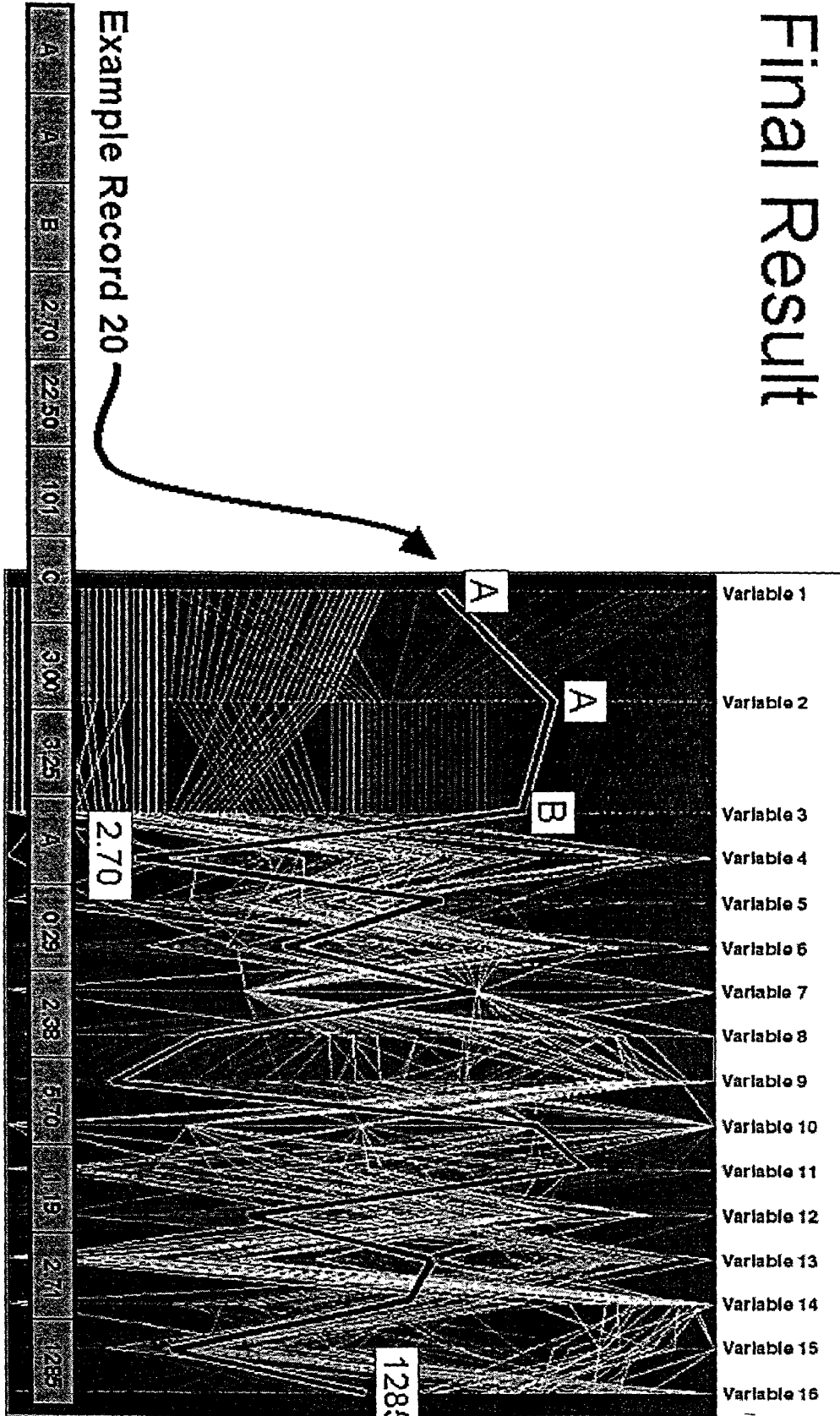


Figure 11D

2218917

# Final Result

## Example Record 20



100% Figure 11E

2218917

# Example record showing the underlying connections

1200

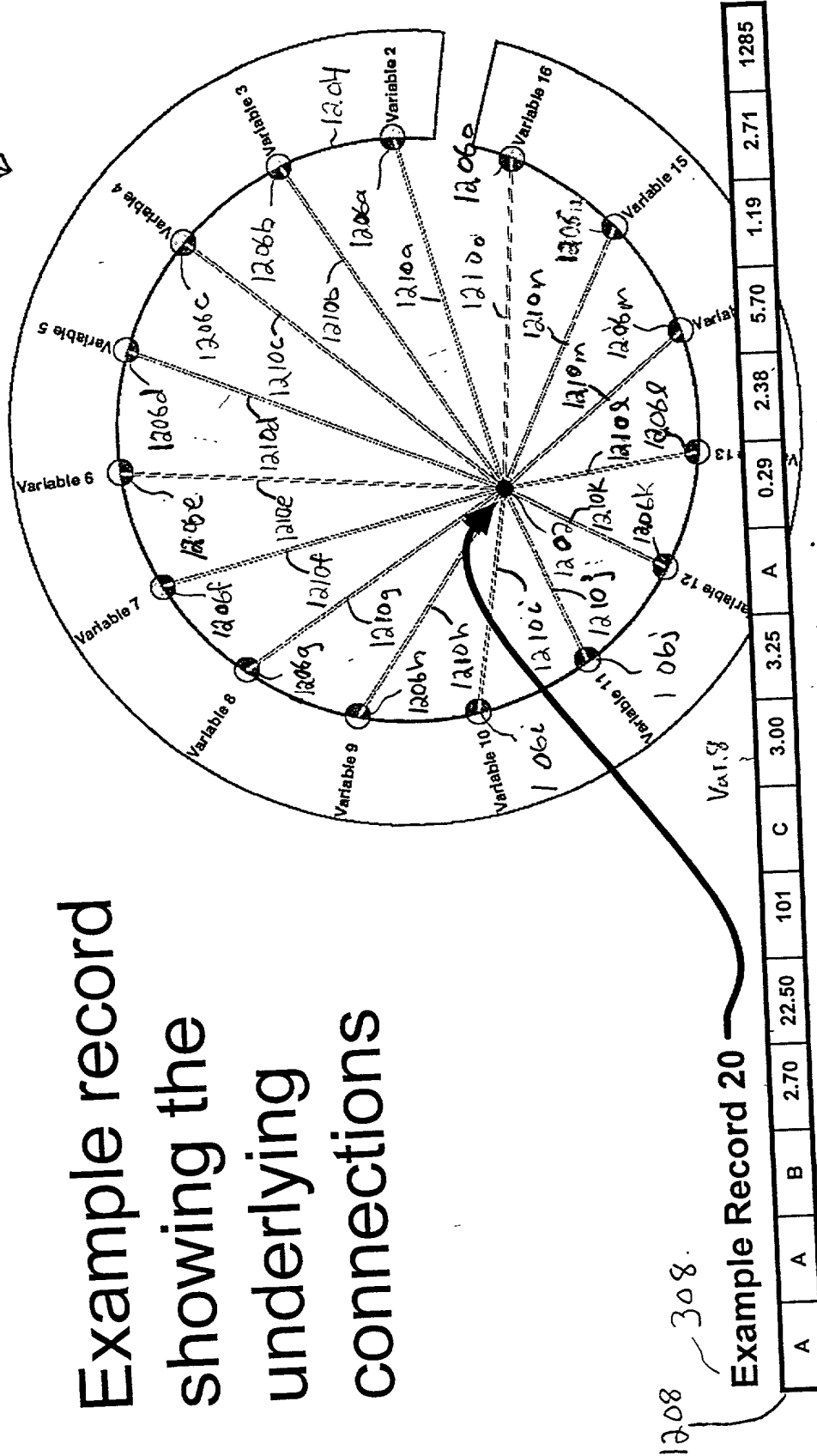


Figure 12A

1200  
2

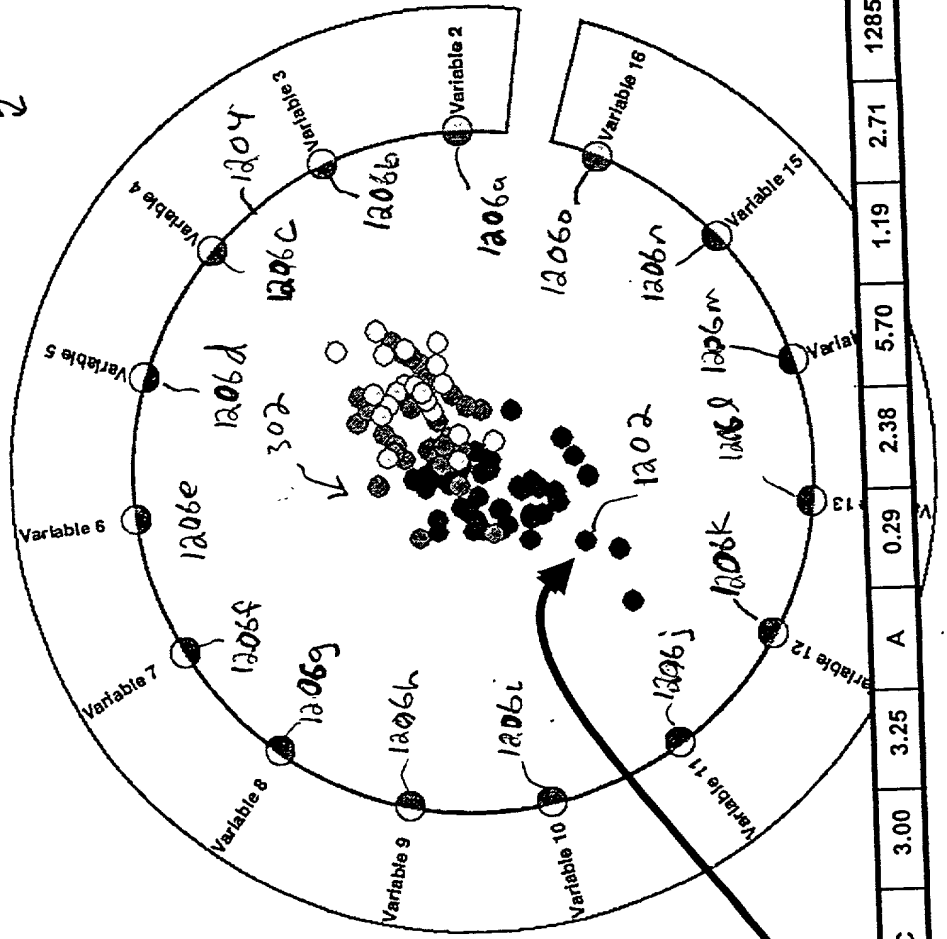


Figure 12B

- AML
- ◐ B-ALL
- T-ALL

1208 308

Example Record 20

2259888

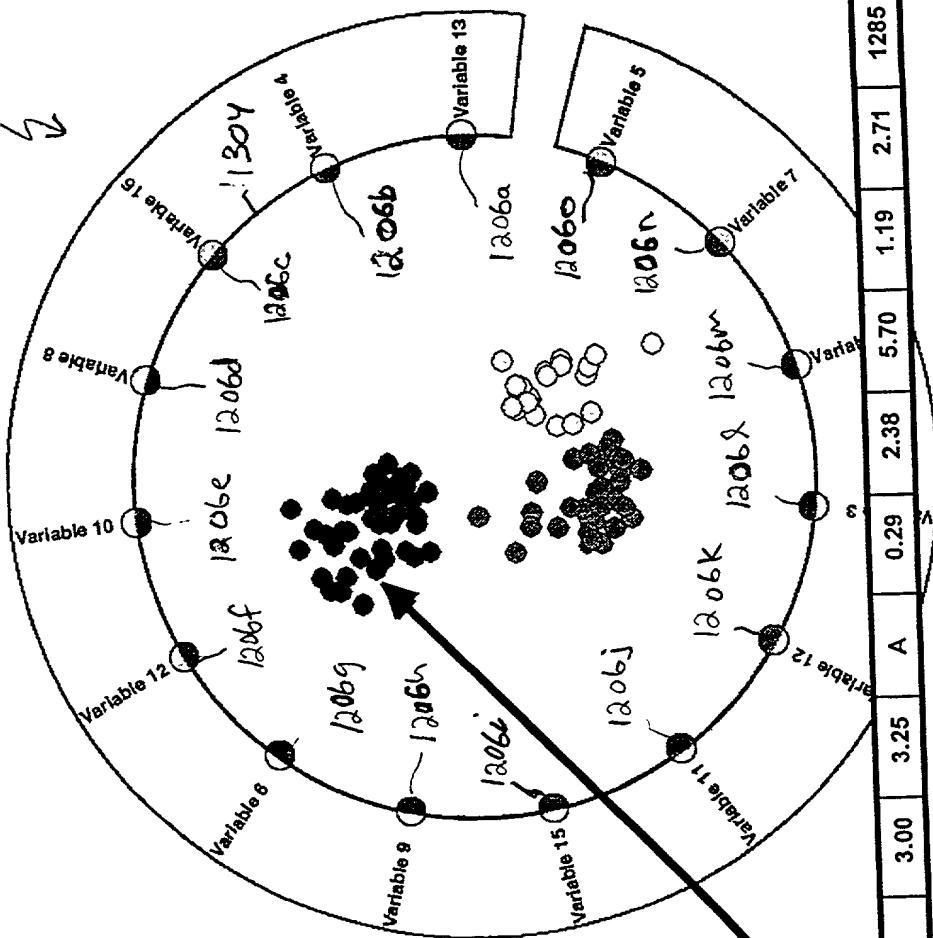
# Visual Classifier

Title: Method And System For Data Analysis  
Inventor(s): Gee et al.  
Serial No. Not yet assigned  
Docket No. ANV-001  
Contact: John V. Bianco 617-248-7870  
Express Mail Label No. EV012824282US Sheet 32 of 79

1200

## Three Classes

- AML
- B-ALL
- T-ALL



Example Record 20

308

1208

A	A	B	2.70	22.50	101	C	3.00	3.25	A	0.29	2.38	5.70	1.19	2.71	1285
---	---	---	------	-------	-----	---	------	------	---	------	------	------	------	------	------

Figure 12C

2259888

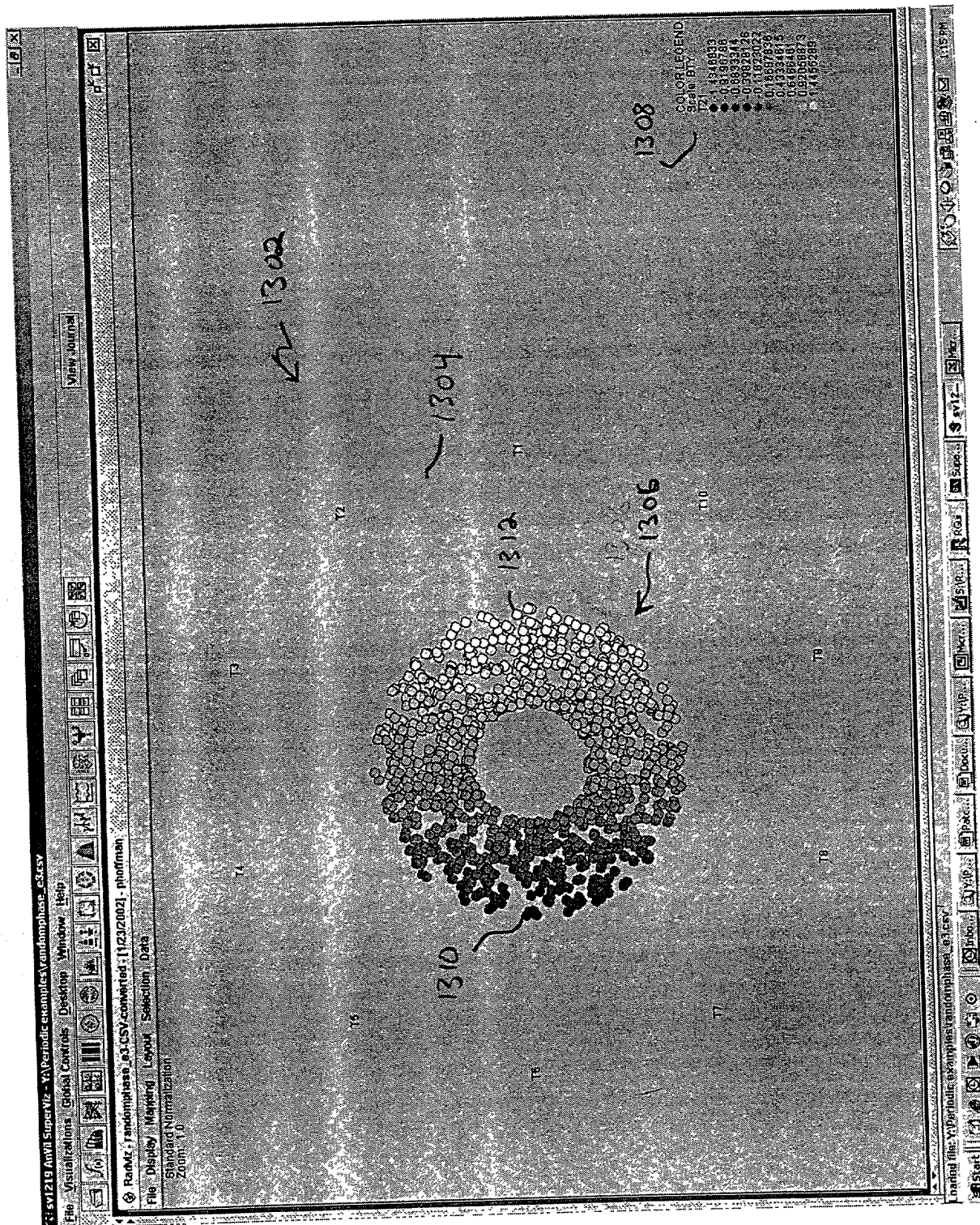


Figure 13A

205F20-459200T

1301

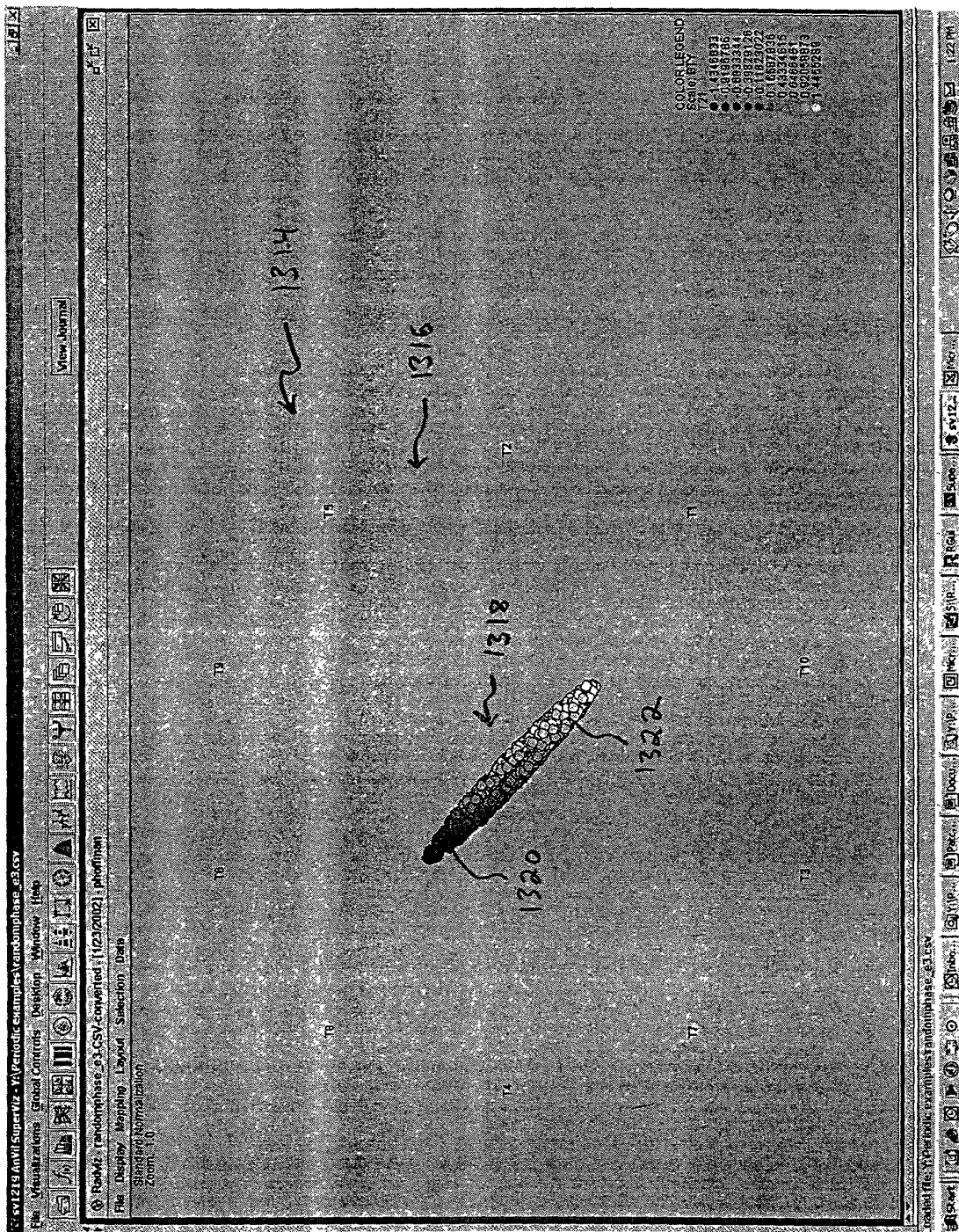


Figure 13B

2269307

205F20"459200T

1303

Title: Method And System For Data Analysis  
Inventor(s): Gee et al.  
Serial No. Not yet assigned  
Docket No. ANV-001  
Contact: John V. Bianco 617-248-7870  
Express Mail Label No. EV012824282US Sheet 35 of 79

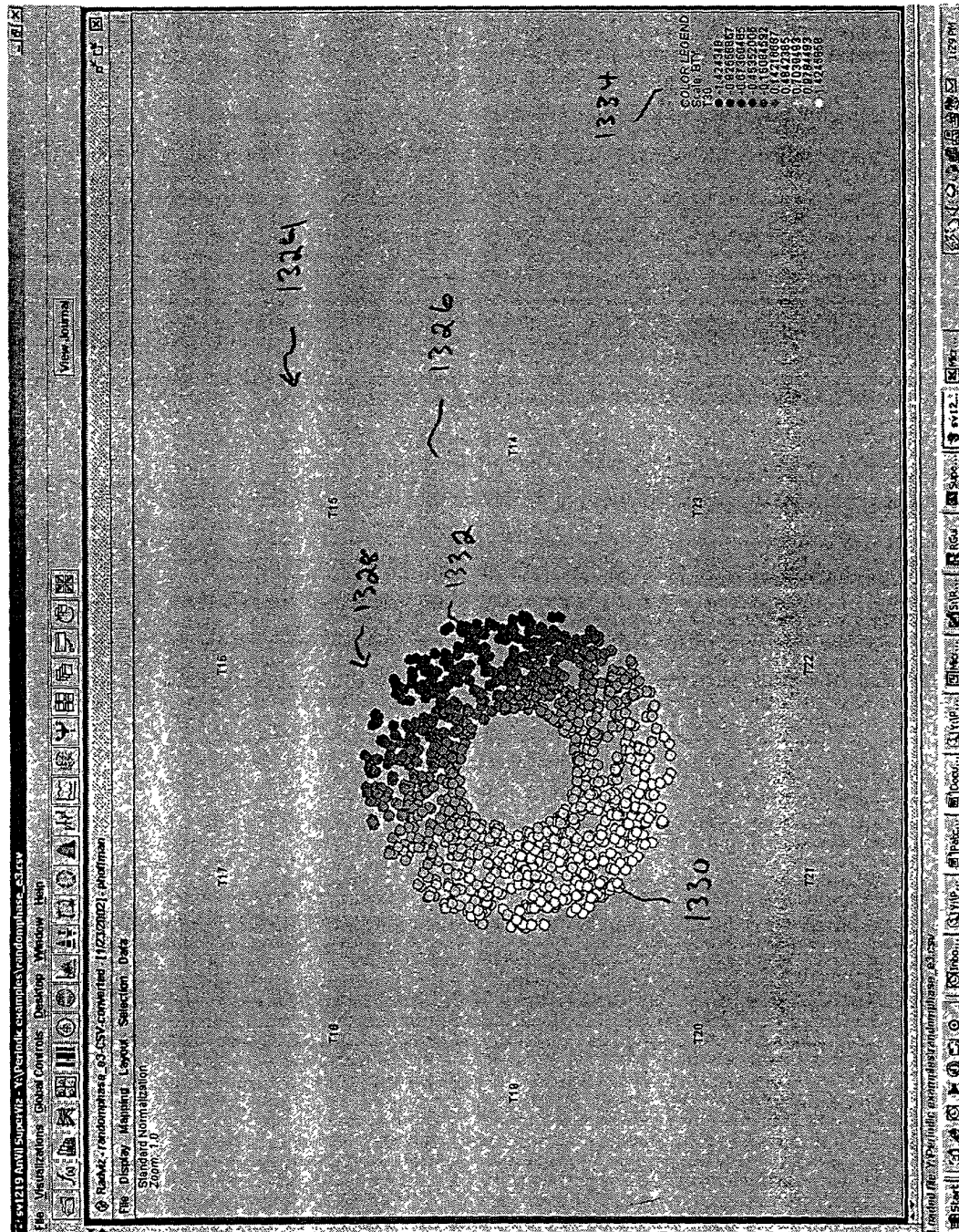


Figure 13C

226937

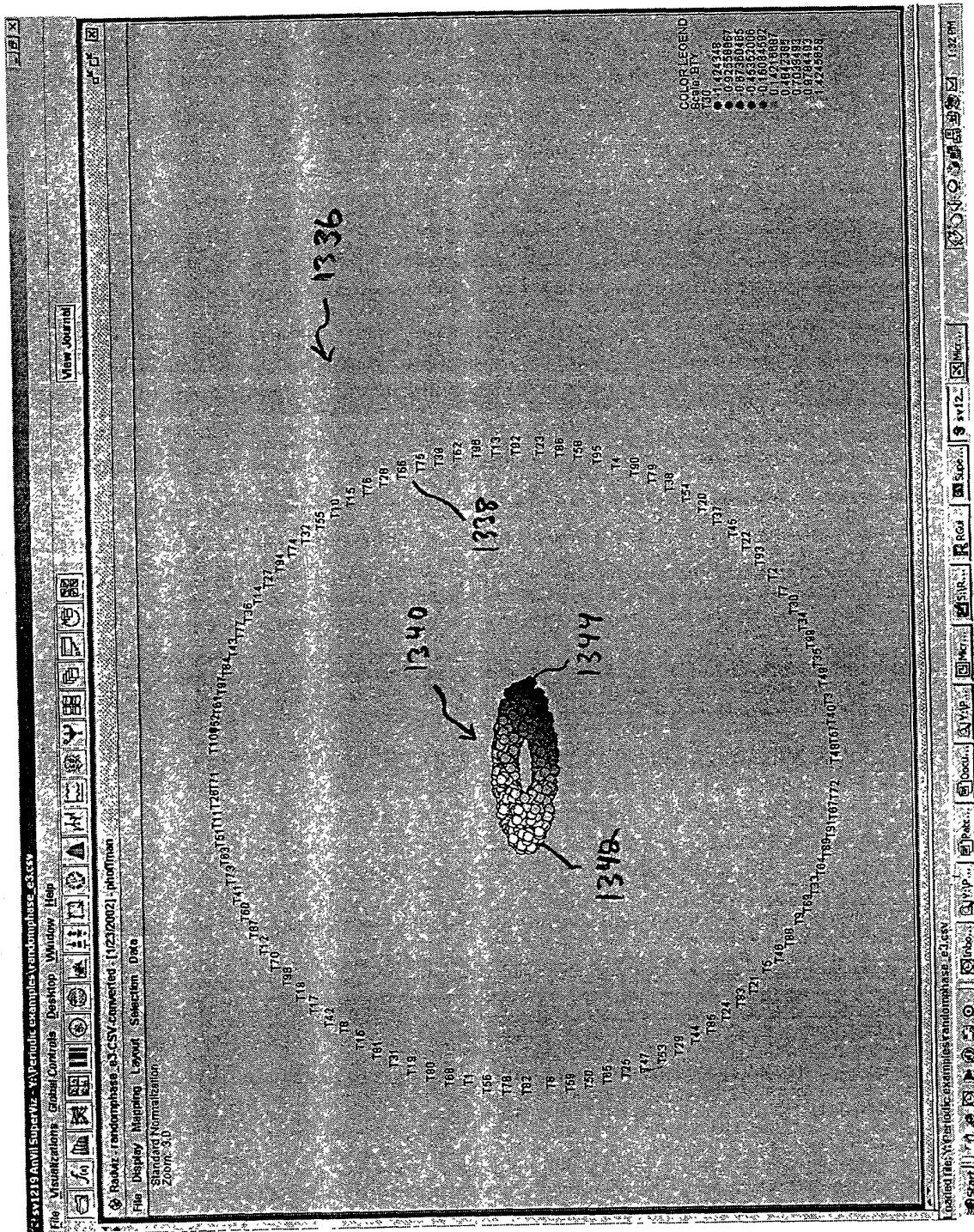


Figure 13D

205120-1634001

1307

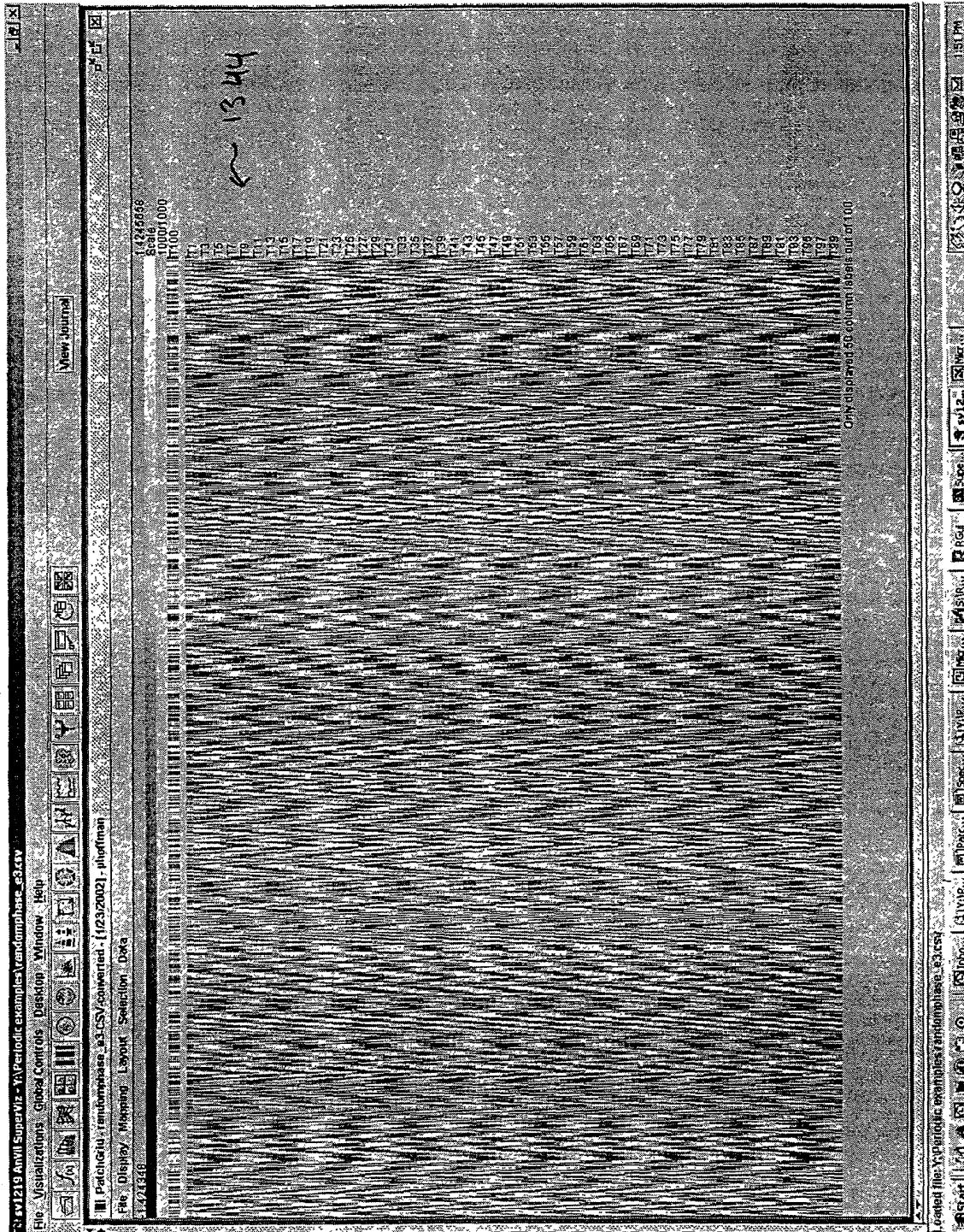


Figure 13B

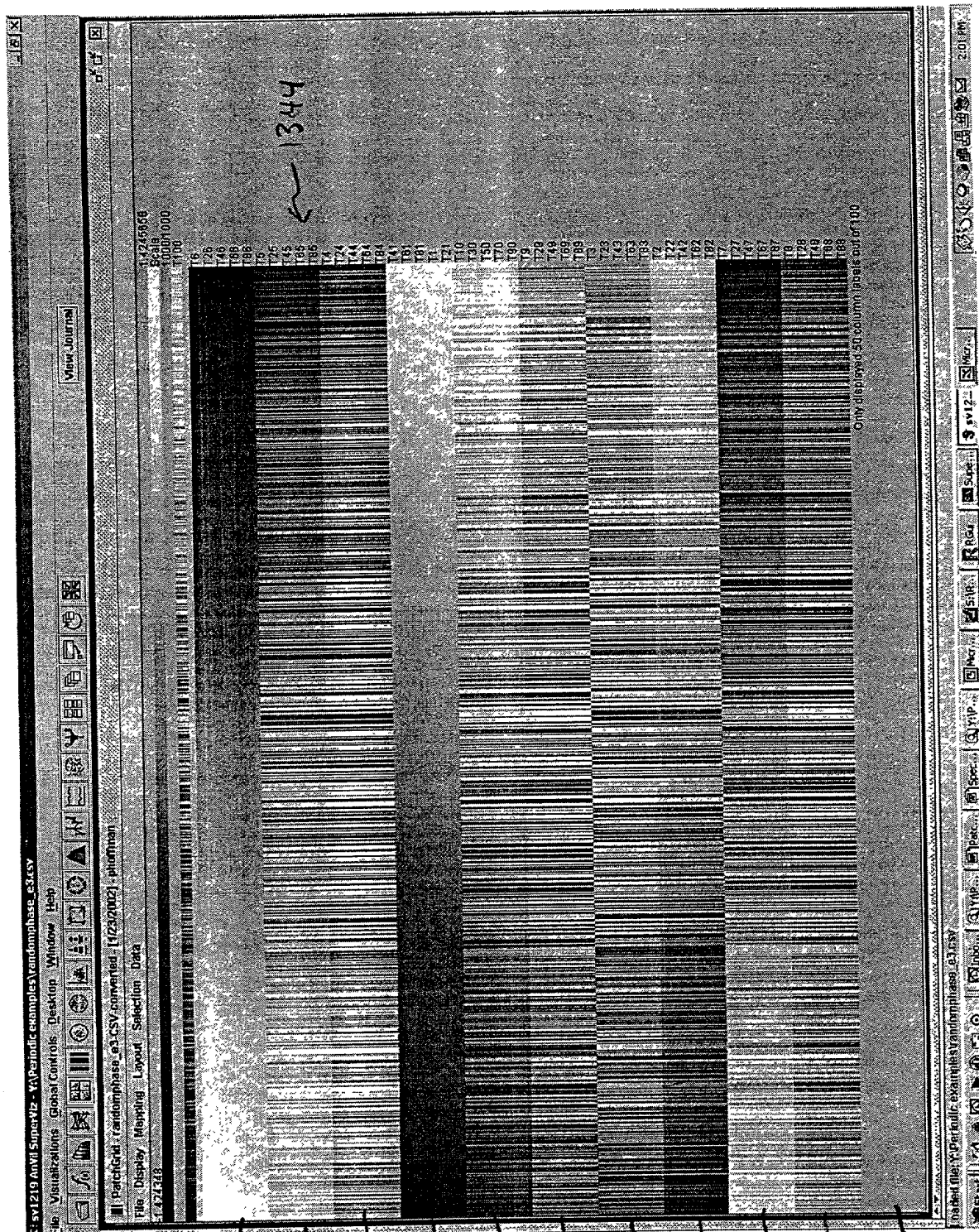
226937

209420-4692000

1309

Title: Method And System For Data Analysis  
Inventor(s): Gee et al.  
Serial No. Not yet assigned  
Docket No. ANV-001  
Contact: John V Bianco 617-248-7870  
Express Mail Label No. EV012824282US Sheet 38 of 79

226937



1346a

1346b

1346c

1346d

1346e

1346f

1346g

1346h

1346i

1346j

1346k

Figure 13c

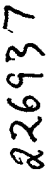


Figure 13G

Transforming a  
 rectangular to a  
 radial layout

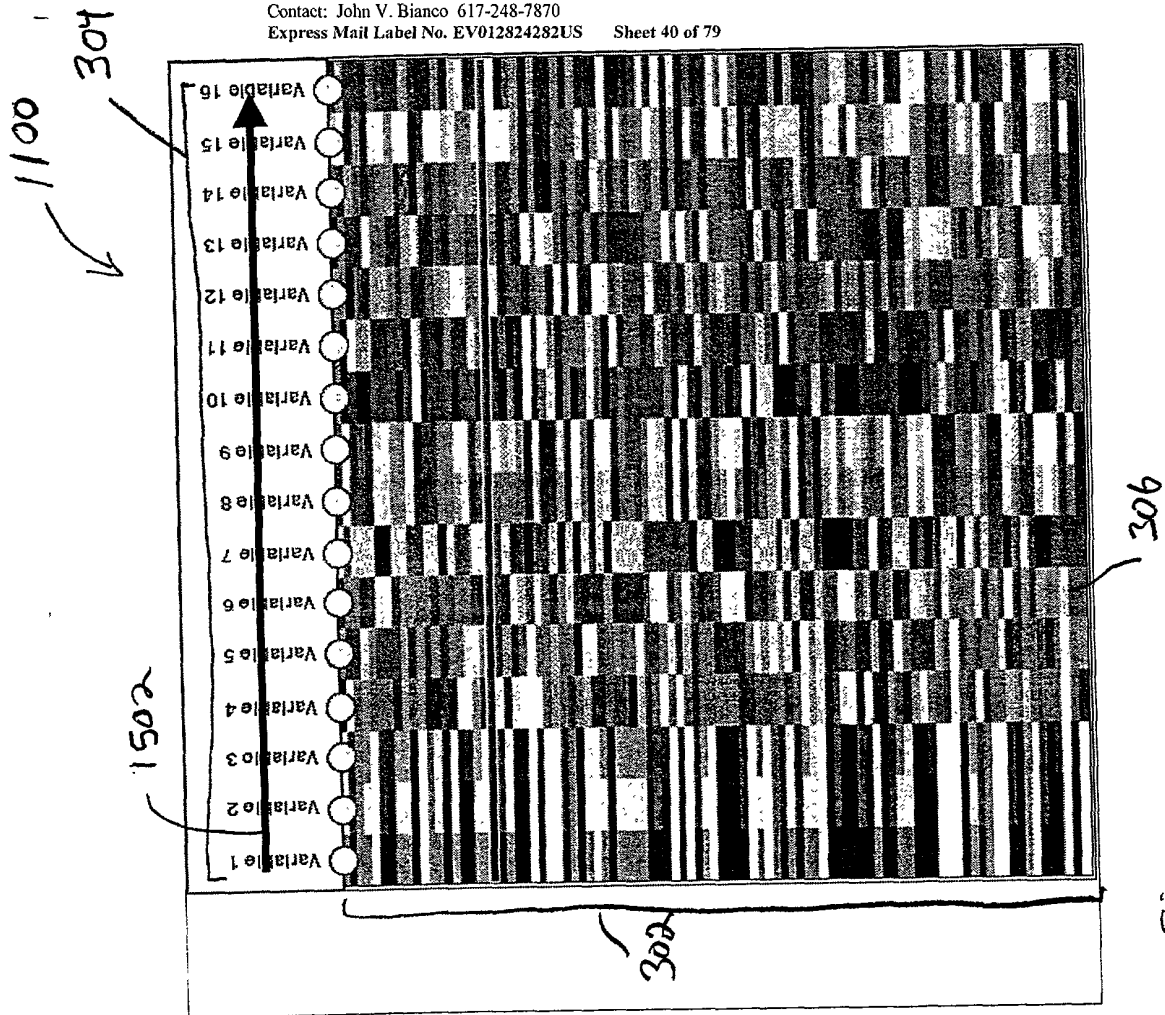


Figure 15A

205120"46922001

0759998

# Radial Layout

Transforming a rectangular to a radial layout

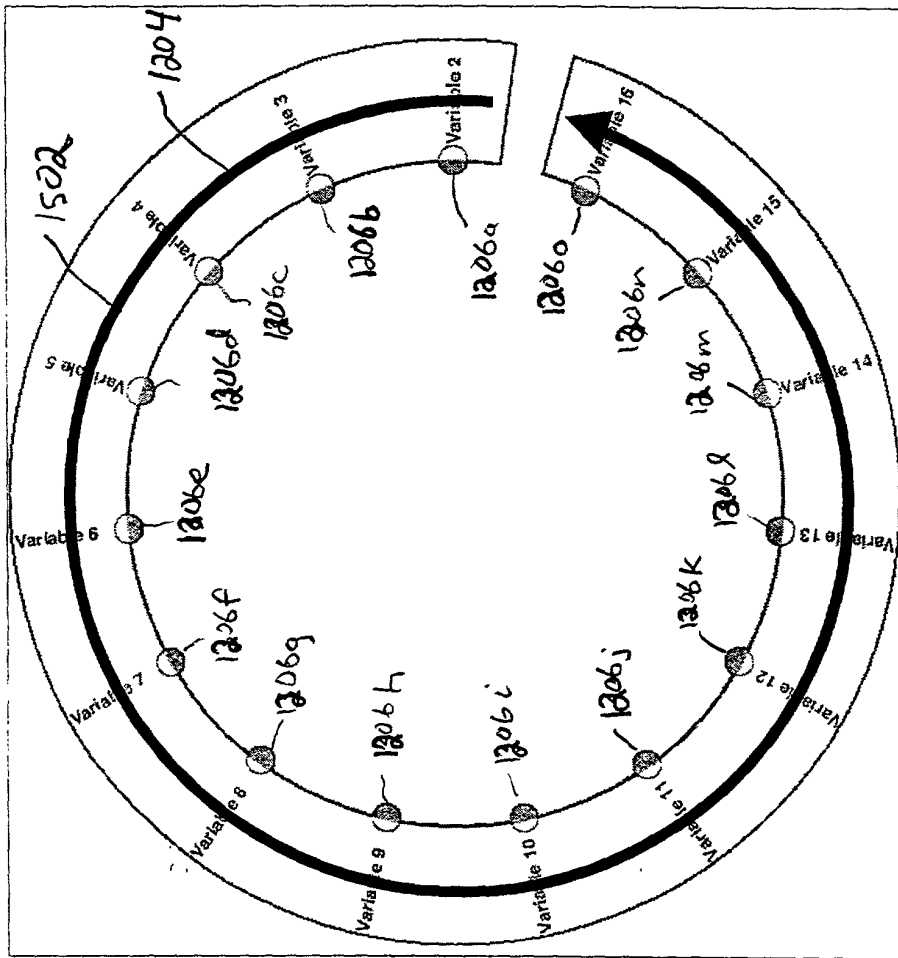


Figure 150

2209 2004

# Radial Layout

Transforming a  
 rectangular to a  
 radial layout

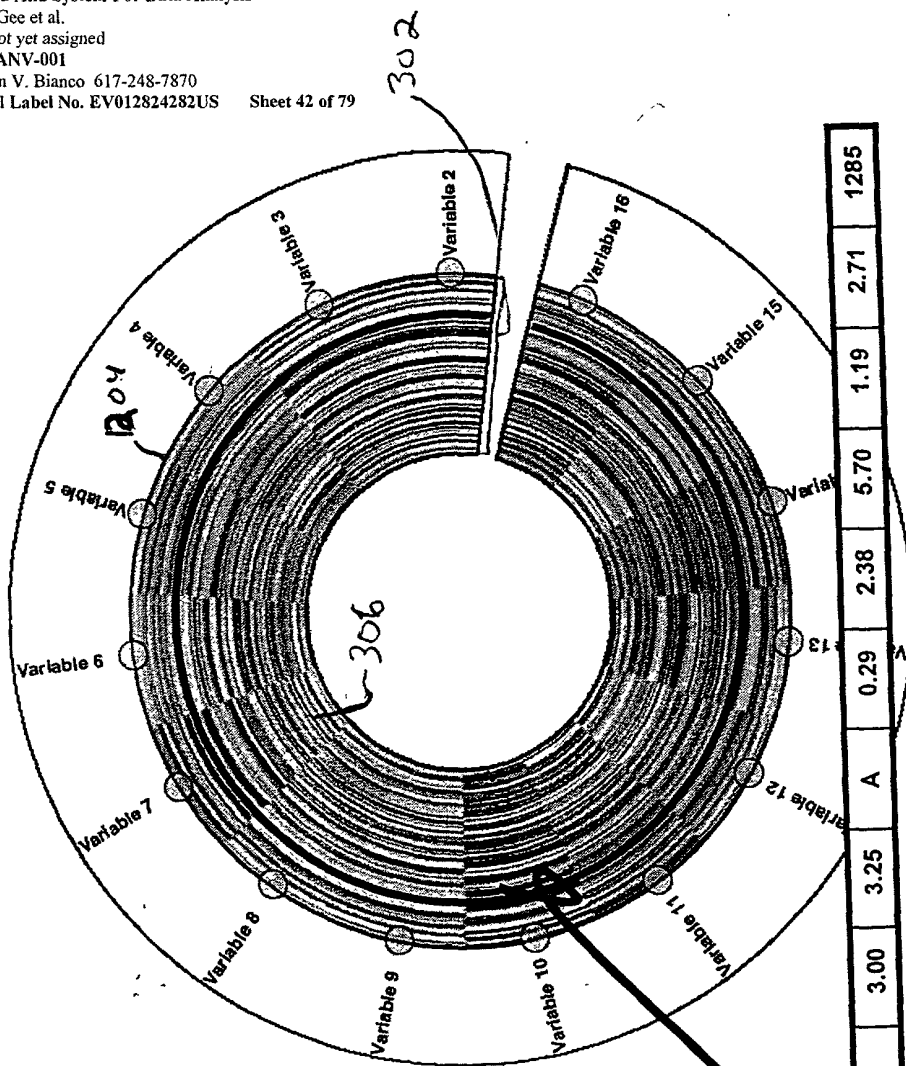


Figure 15C

308

Example Record 20

1208

2000000

# Shape Control - Before Moving Anchors

1606

Exons  
Introns

1607

+

tt1

aa2

ac2

ag2

at2

ca2

cc2

cg2

ct2

ga2

gc2

gg2

gt2

ta2

tc2

tg2

tt2

aa3

ac3

ag3

at3

ca3

cc3

cg3

ct3

ga3

gc3

gg3

gt3

ta3

tc3

tg3

tt3

aa1

ac1

ag1

at1

ca1

cc1

cg1

ct1

ga1

gc1

gg1

gt1

ta1

tc1

Figure 16A

2218917

209120-4694001

# Shape Control - Ellipse

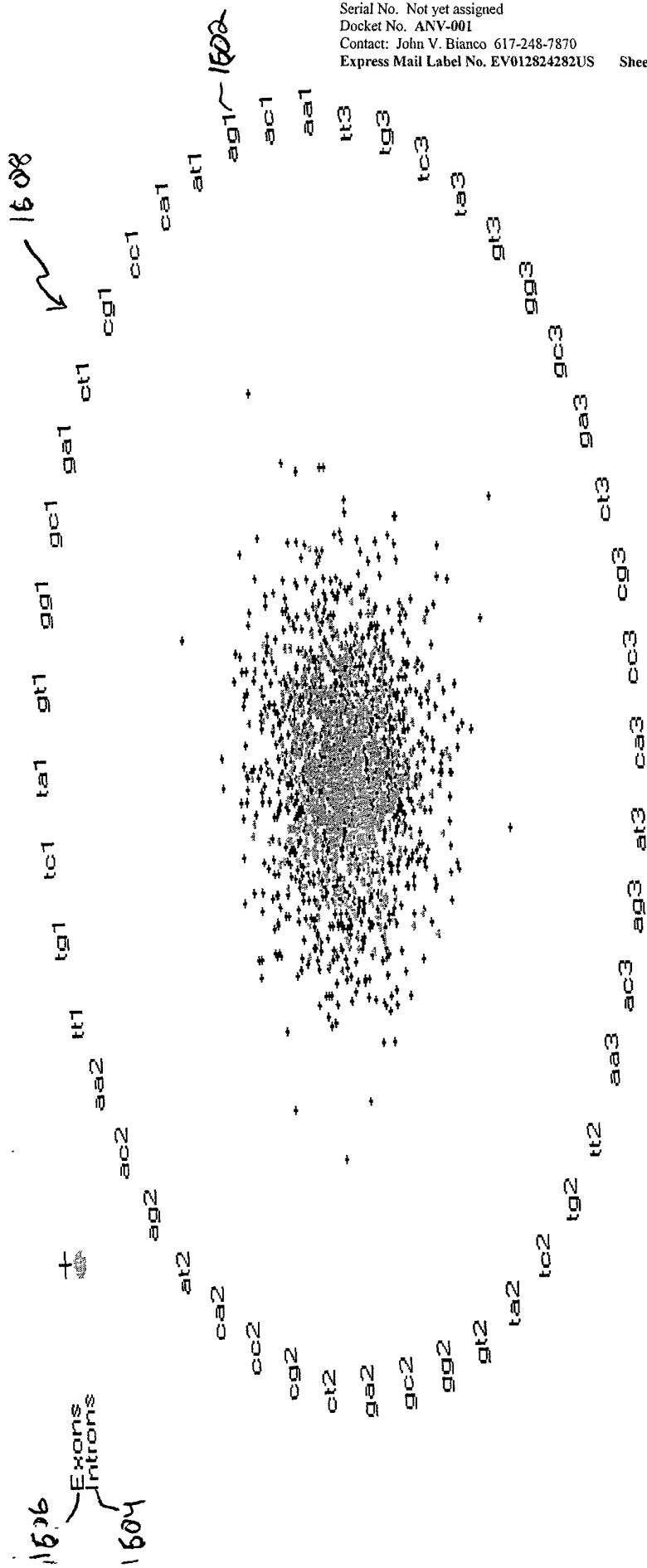


Figure 163

2218917

EV012824282US

# Shape Control - Arbitrary Spline

1506  
1504  
Exons  
Introns

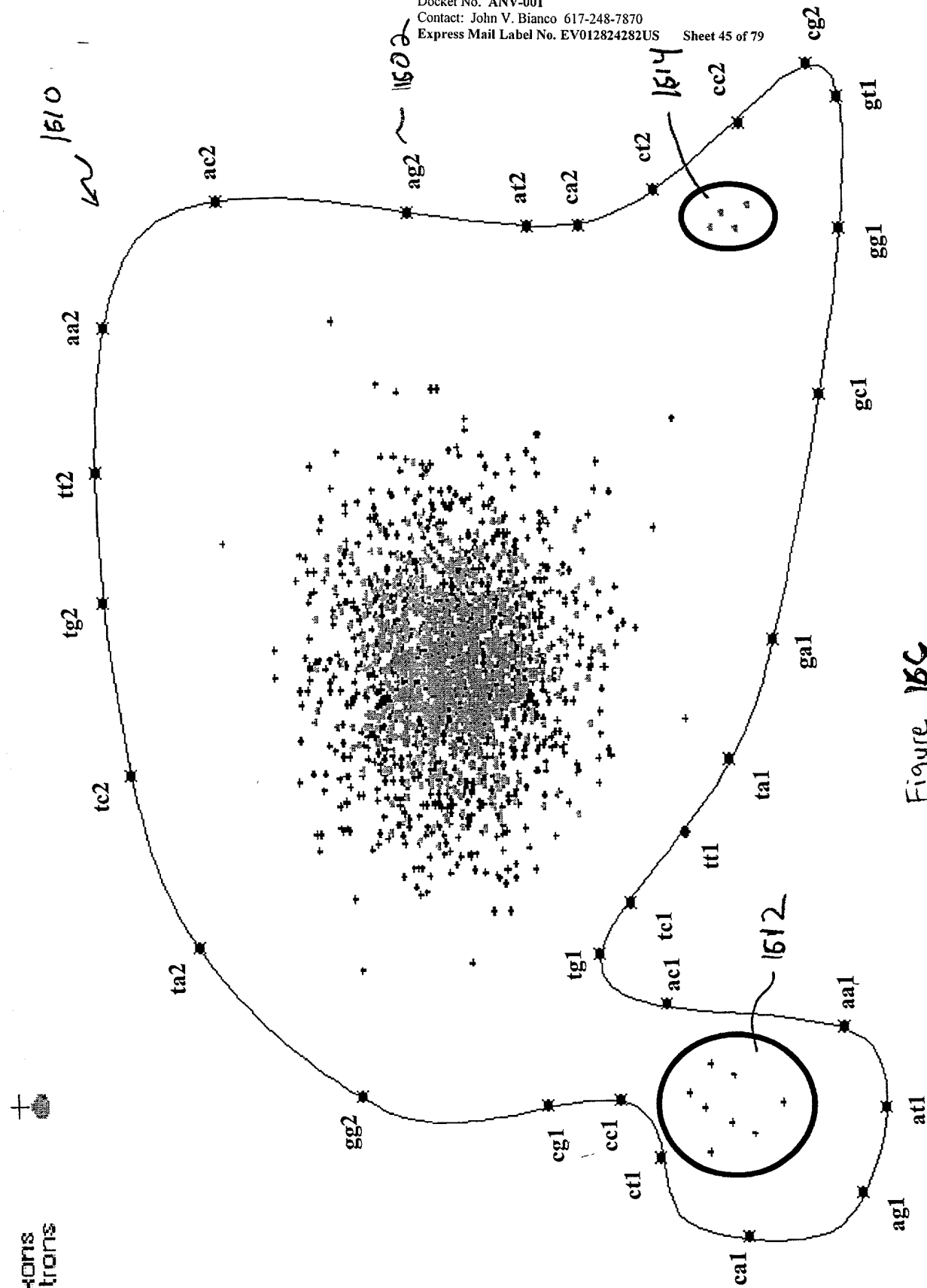


Figure 16C

62-1620

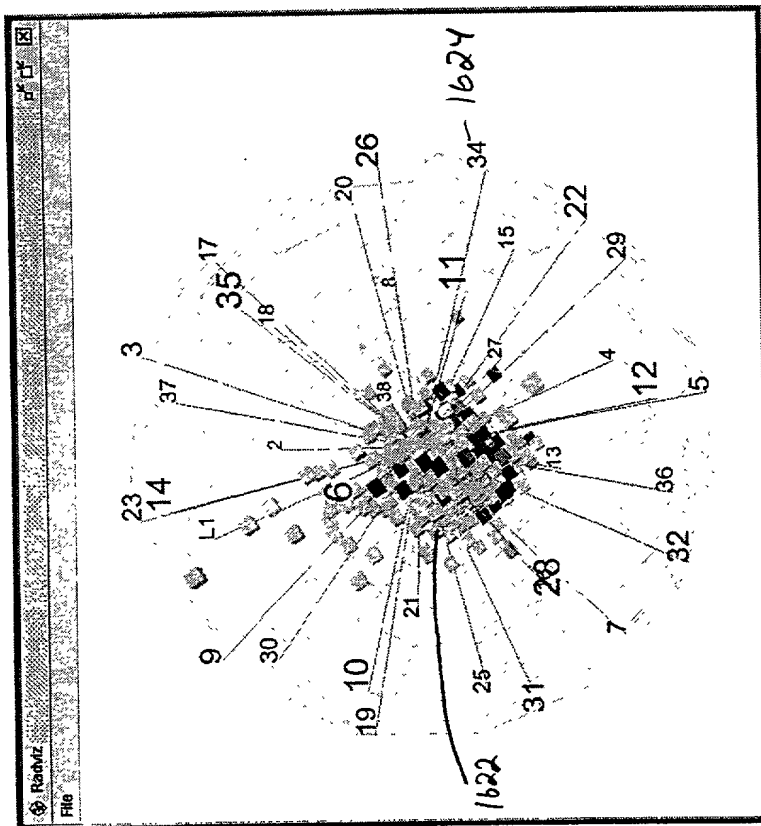


Fig. 16D



Figure 17

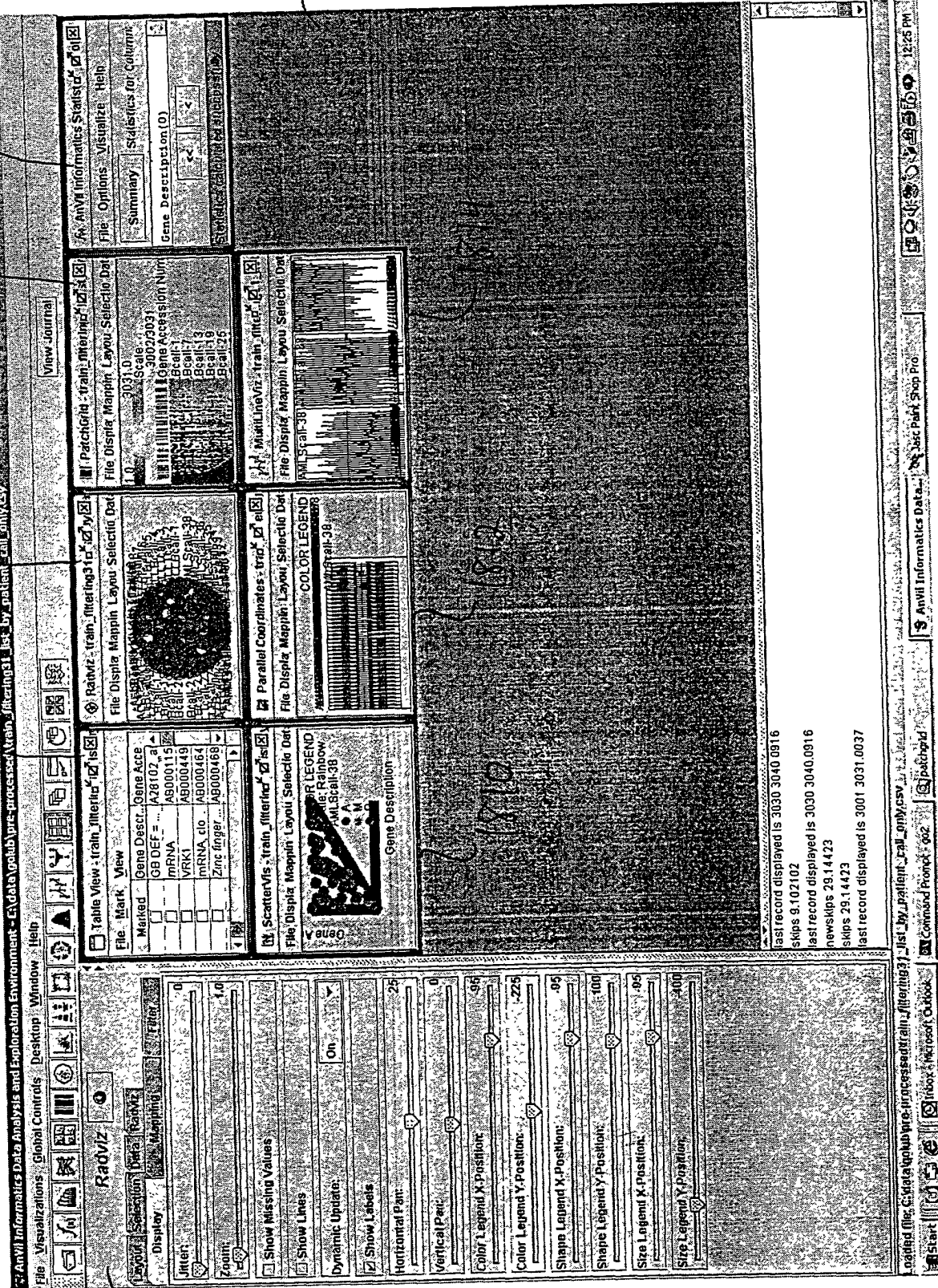
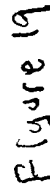


Figure 18

2218917

1706



710815

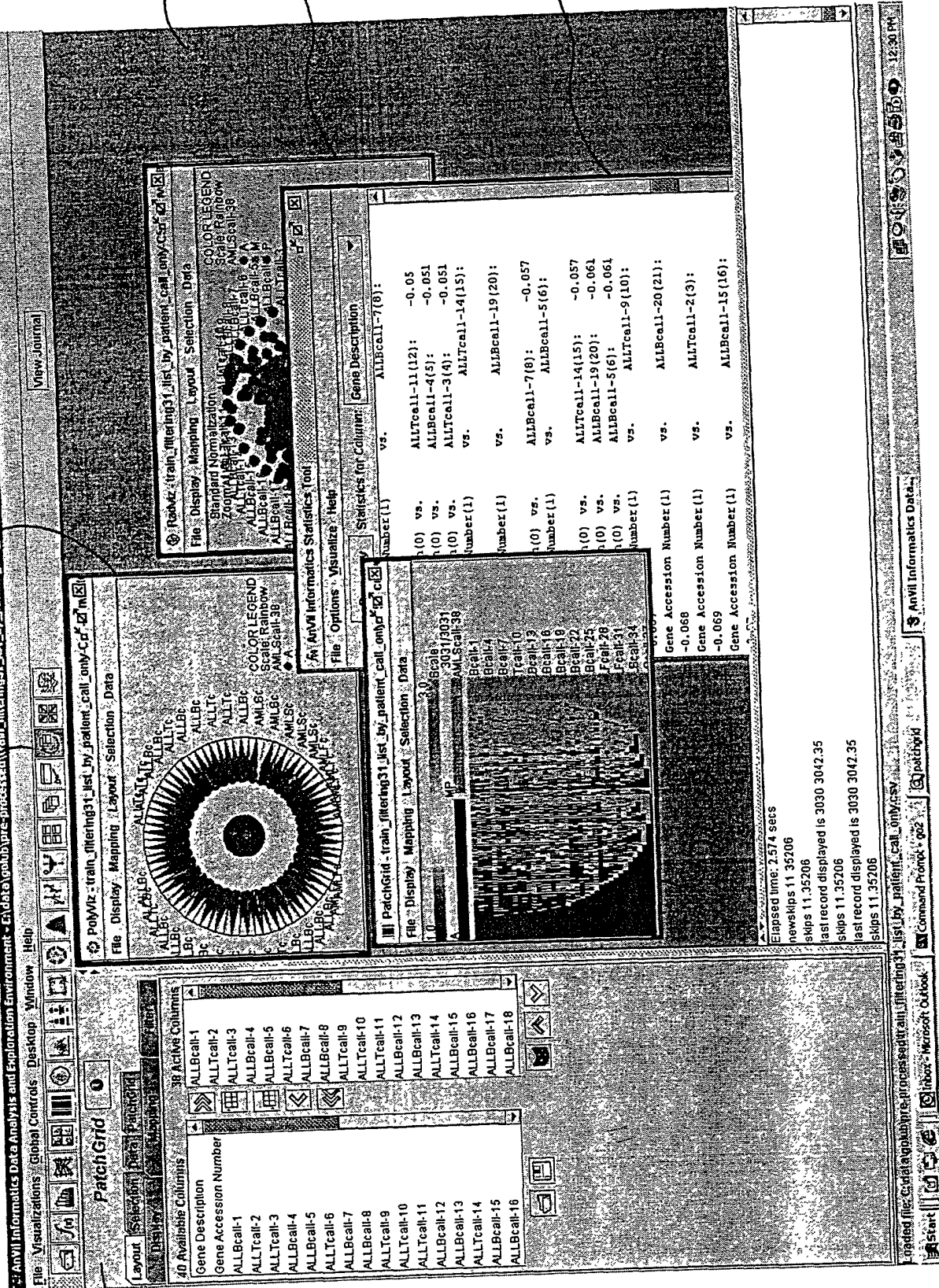


Figure 20

2012-11-09 11:09 AM

2100

1706

Title: Method And System For Data Analysis  
Inventor(s): Gee et al.  
Serial No. Not yet assigned  
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2174305

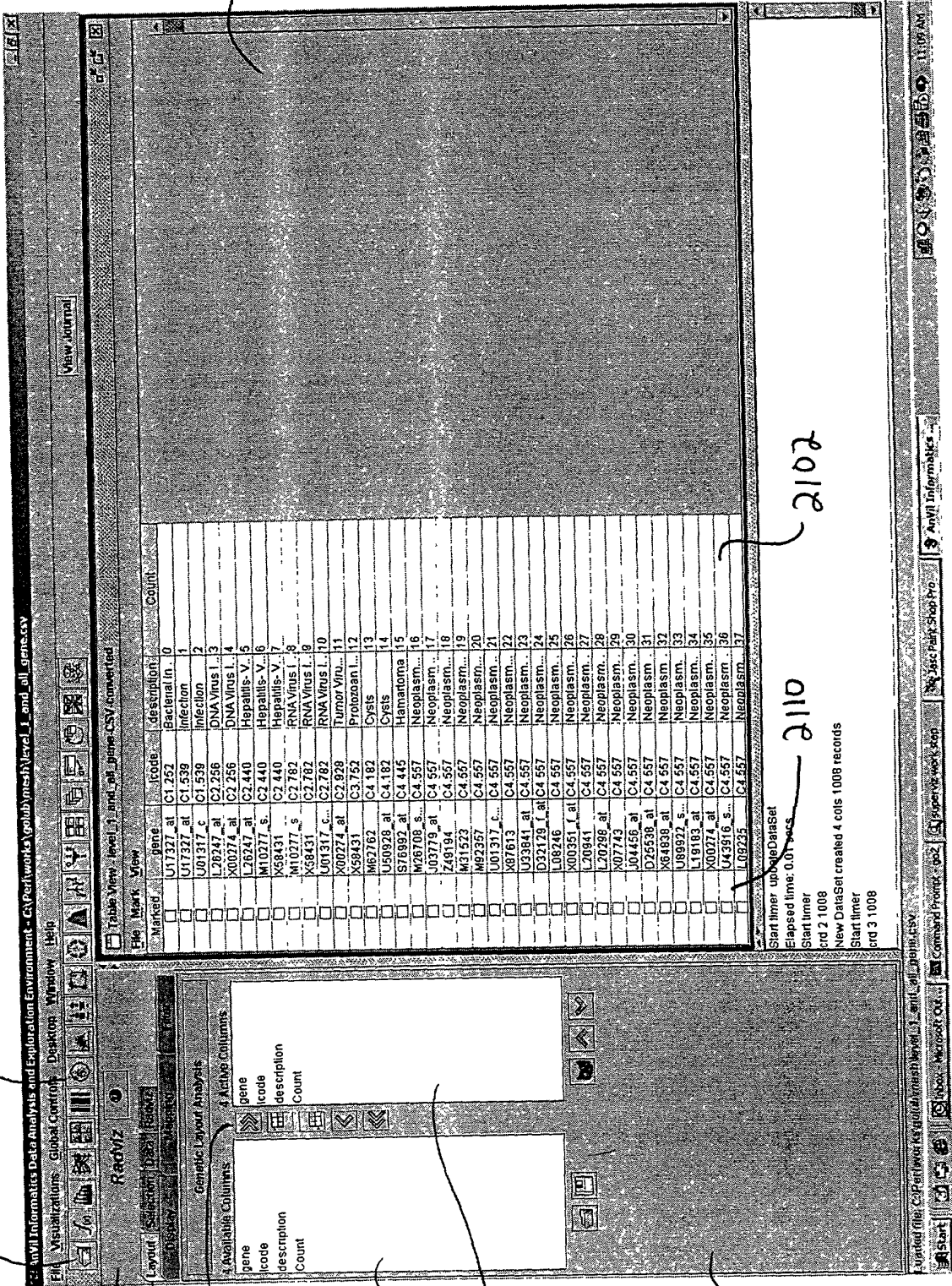


Figure 21

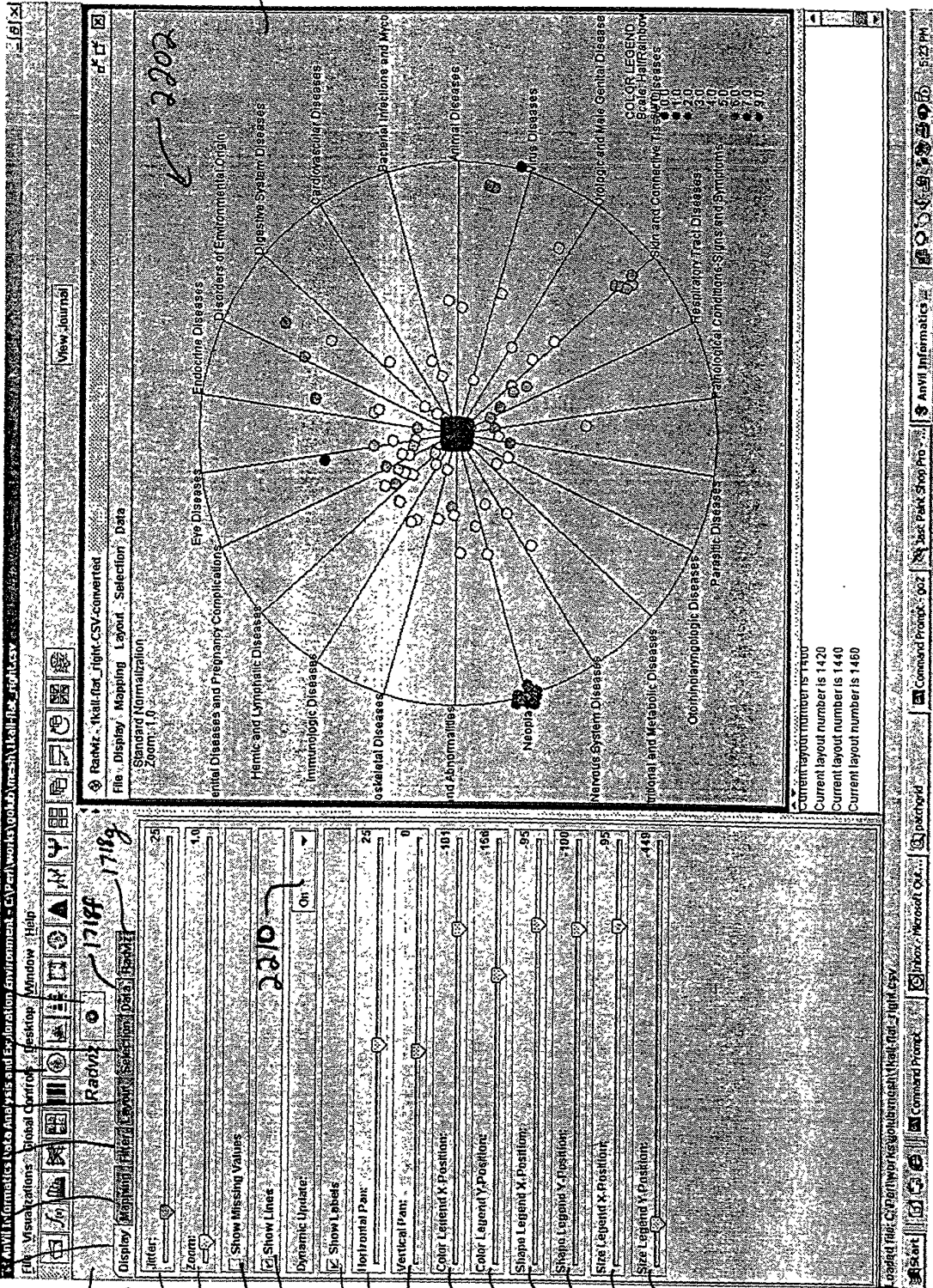


Figure 22

1708  
 1718  
 2206a  
 2206b  
 2208a  
 2209b  
 2208c  
 2206c  
 2206d  
 2206e  
 2206f  
 2206g  
 2206h  
 2206i  
 2206j

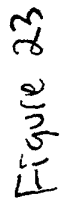
205F20" 1694.4001

1718a 1718b 1718c 178d 1718e  
 1710g 2204

2200

1706

22189

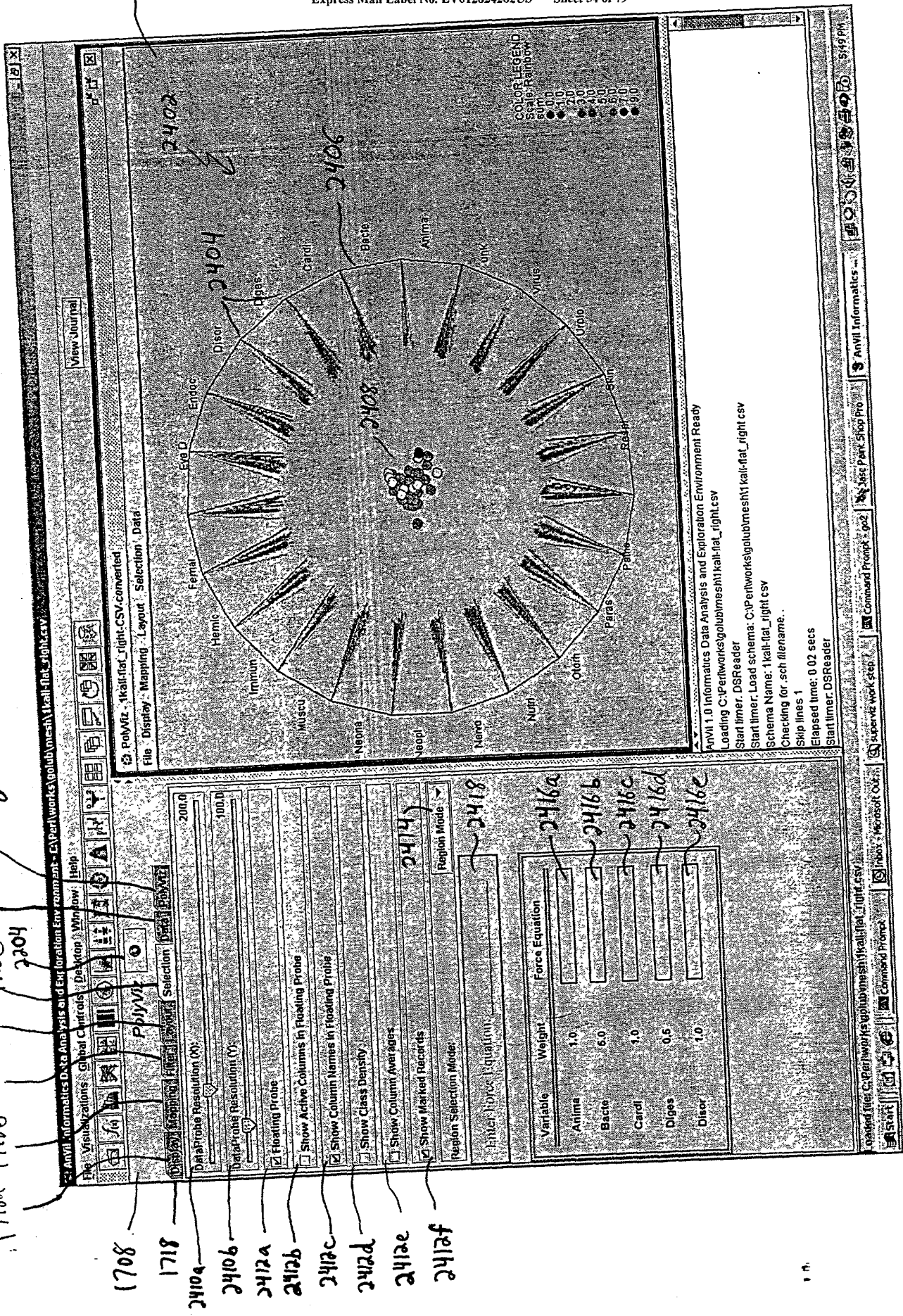


2400

1708

Figure 24

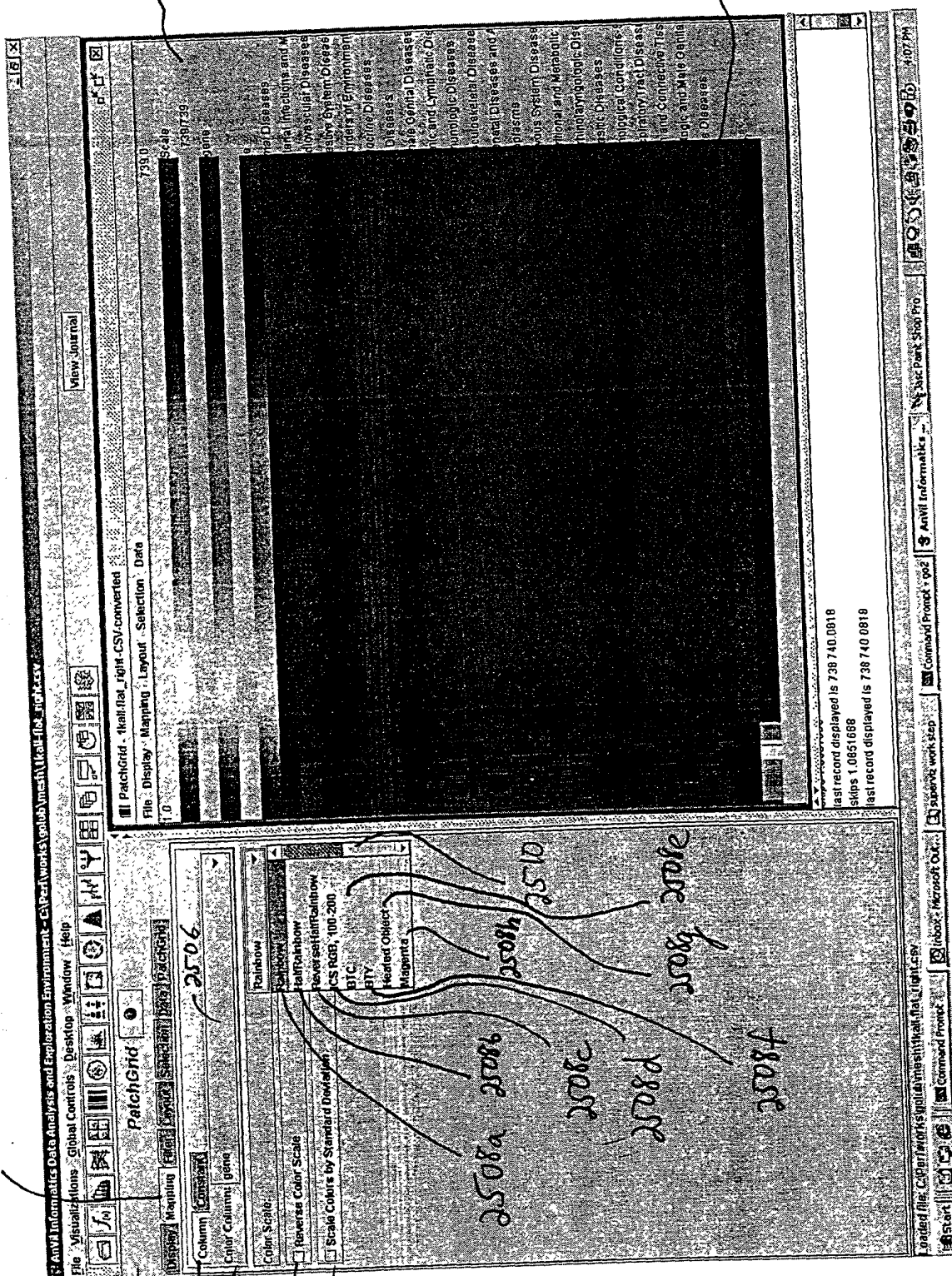
24189

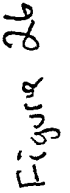


1718a 1718b 1718c 1718d 1718f 1718g 1718e 2404

2410a 2410b 2412a 2412b 2412c 2412d 2412e 2412f

24189





205720-1694001

2702a

1718c

2702c

1708

2702

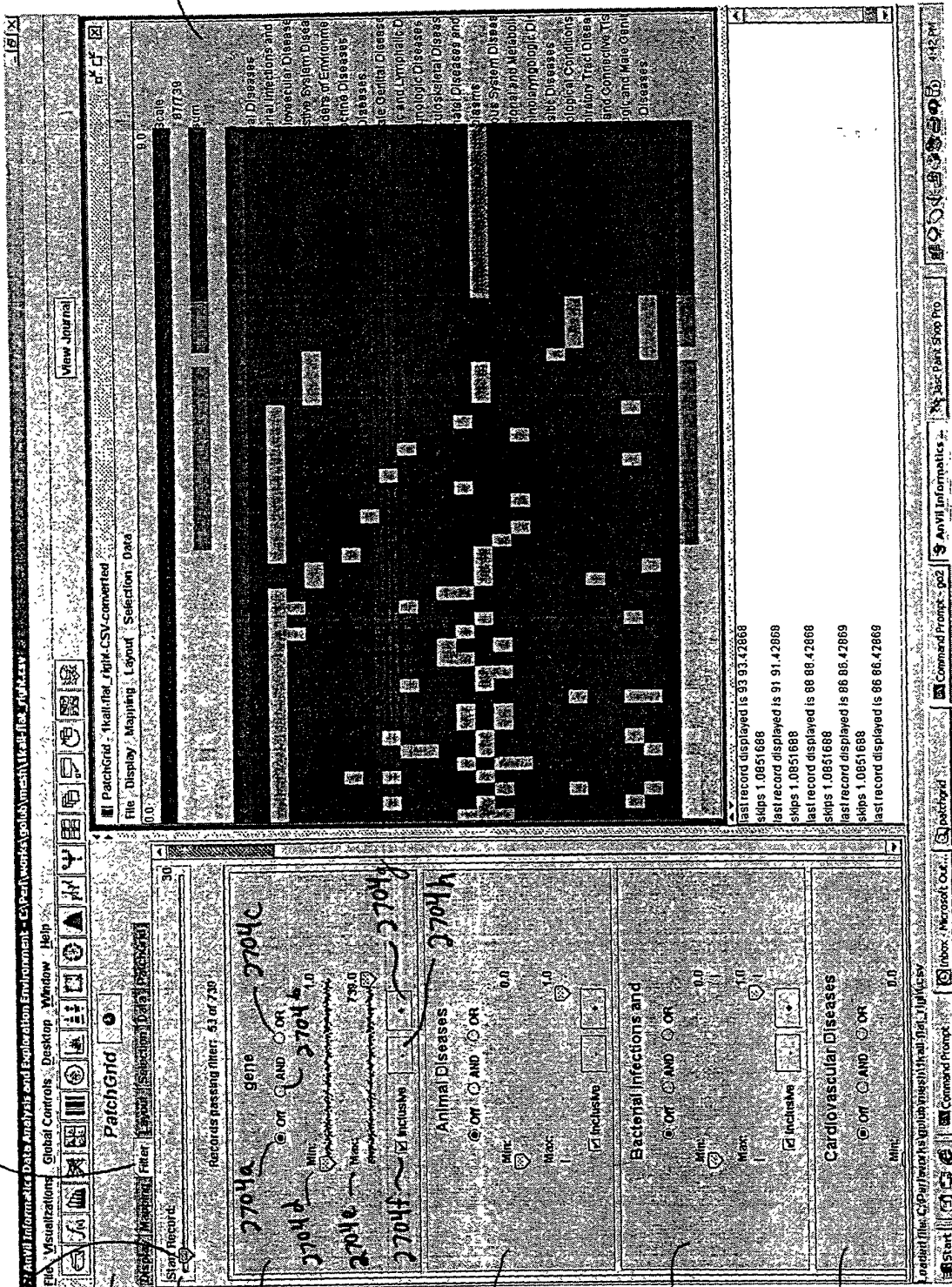
2704

2706

2708

2710

1706



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Figure 27

201817

288

1708

2810

1706

68126

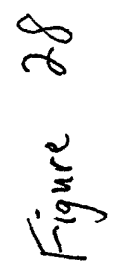


Figure 28

2900

2904 2904 2904 2904 2904

1708

2902a

2902b

2904a

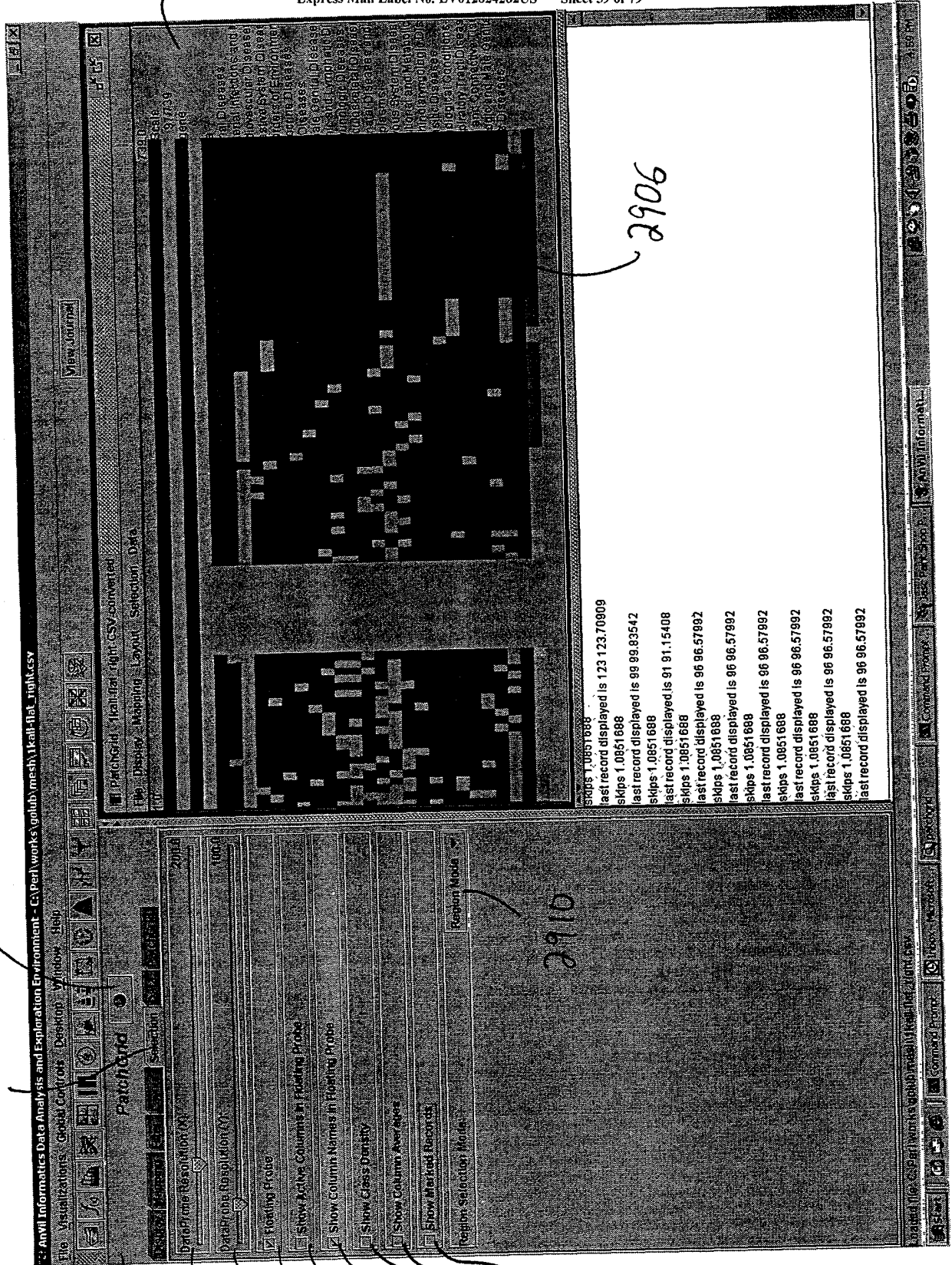
2904b

2904c

2904d

2904e

2904f



2906

2910

Figure 29

2171



116a 116c 1716f

716a 1716b

1708





Figure 32

3300

2009-04-20 14:59:20.001

1706

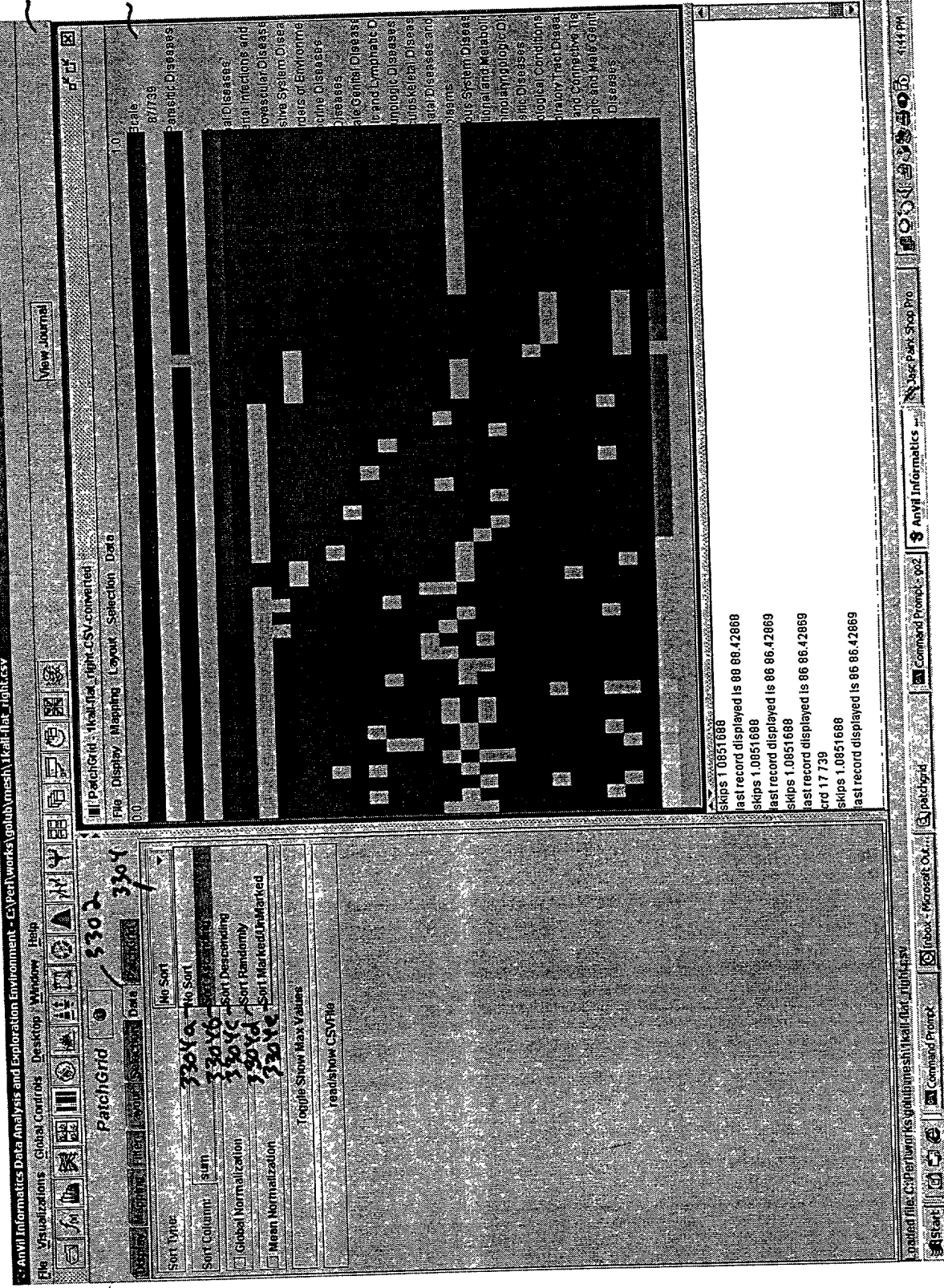


Figure 33

1708

# Chemotherapy

- 76 Gene Predictor Set
  - Success
  - Failure
- Boundary



2259884

# Reduced Genes

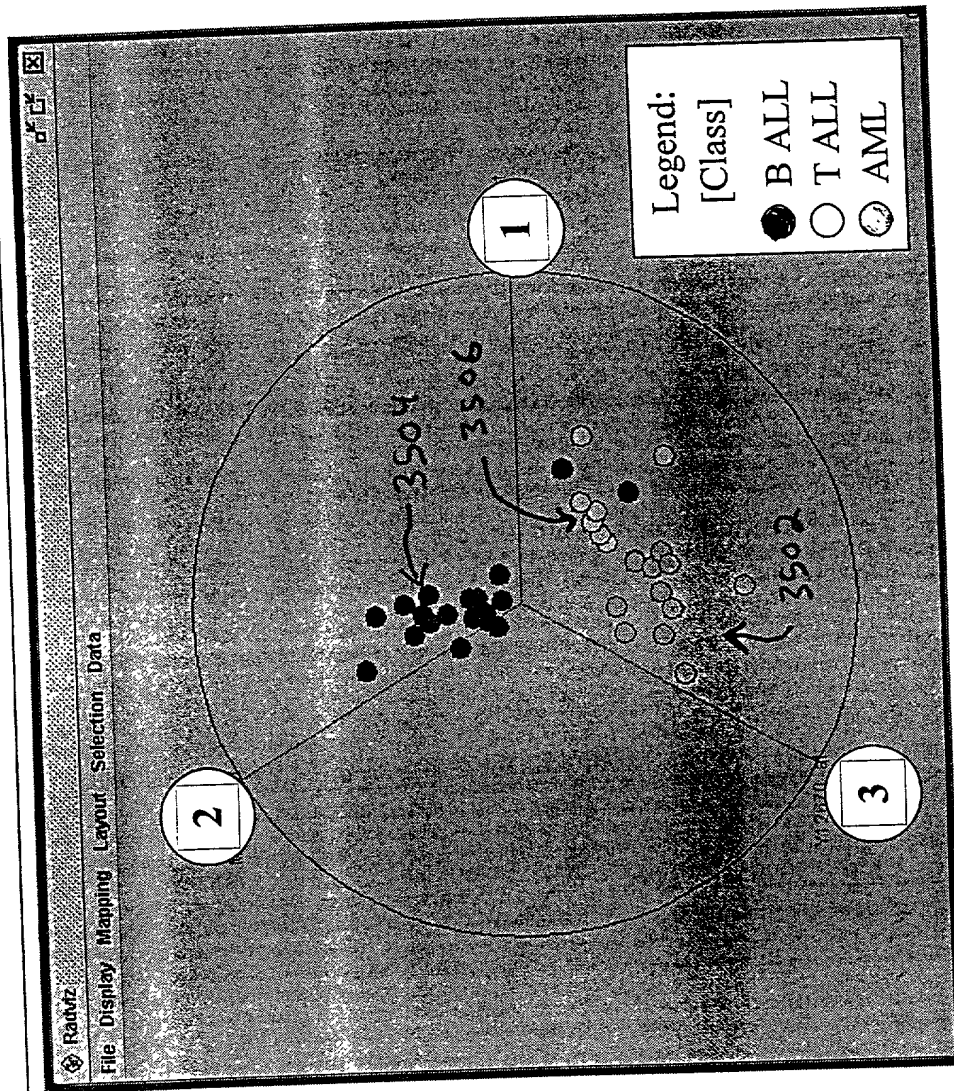


Figure 35

2259884

# Chemical Structure

Benzodiazepines

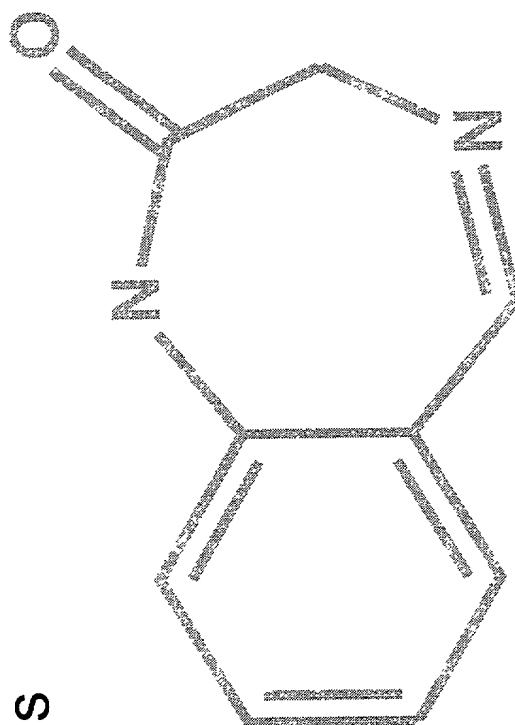


Figure 36

# Radial Visualization Showing R<sub>3</sub> Attributes

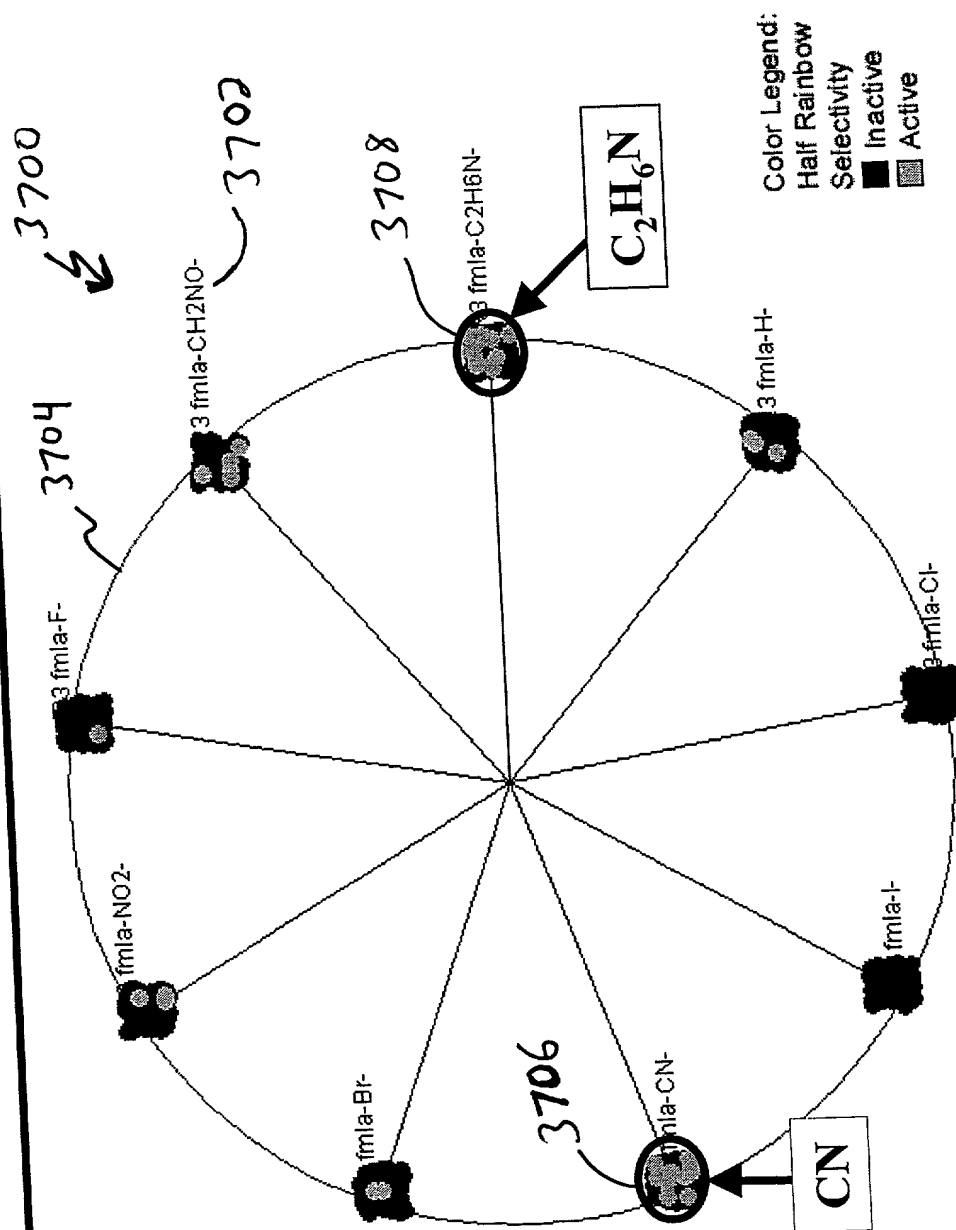


Figure 37

# Radial Visualization Showing $R_3$ & $R_4$ Attributes

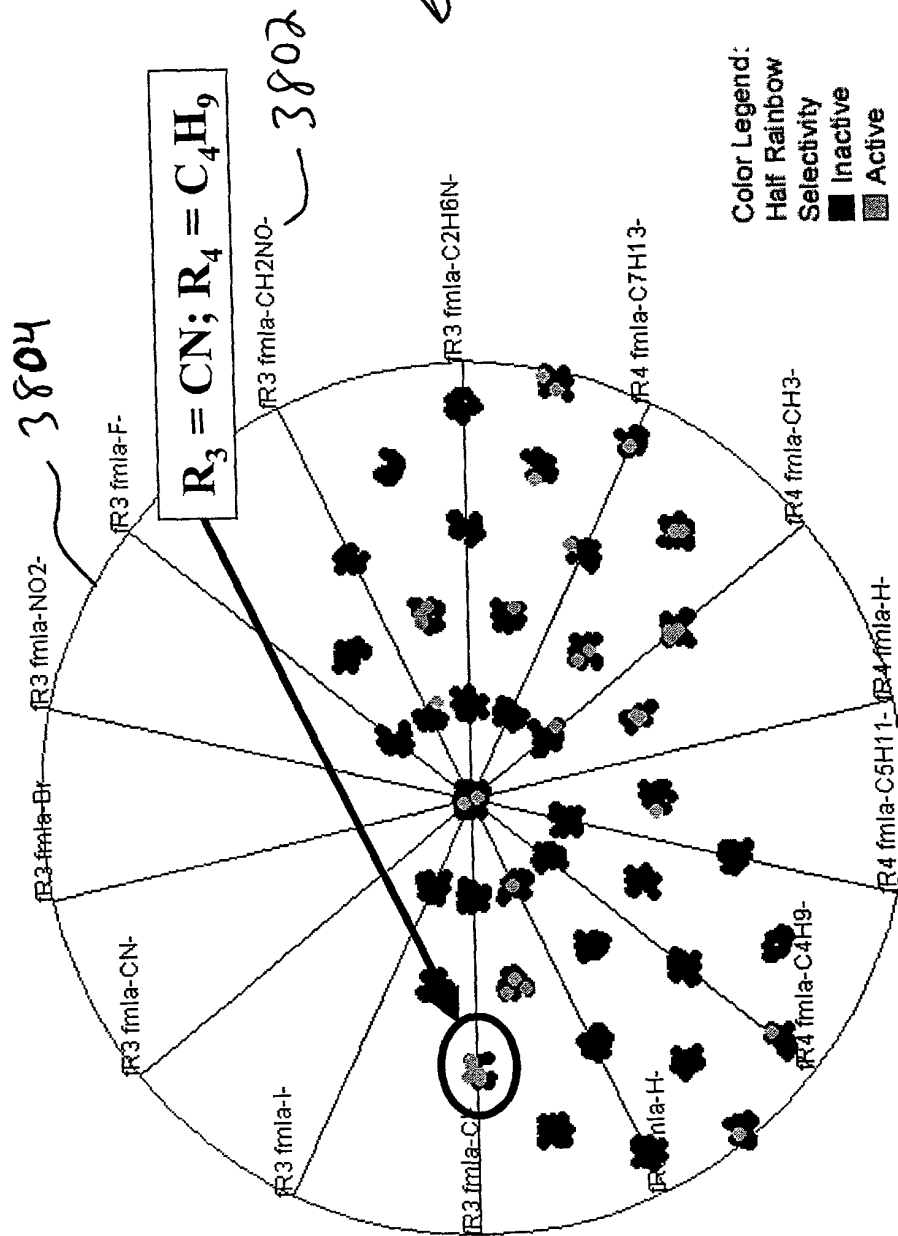


Figure 38

2273661

205120-4692001

# Radial Visualization Showing R<sub>3</sub> & R<sub>4</sub> Attributes

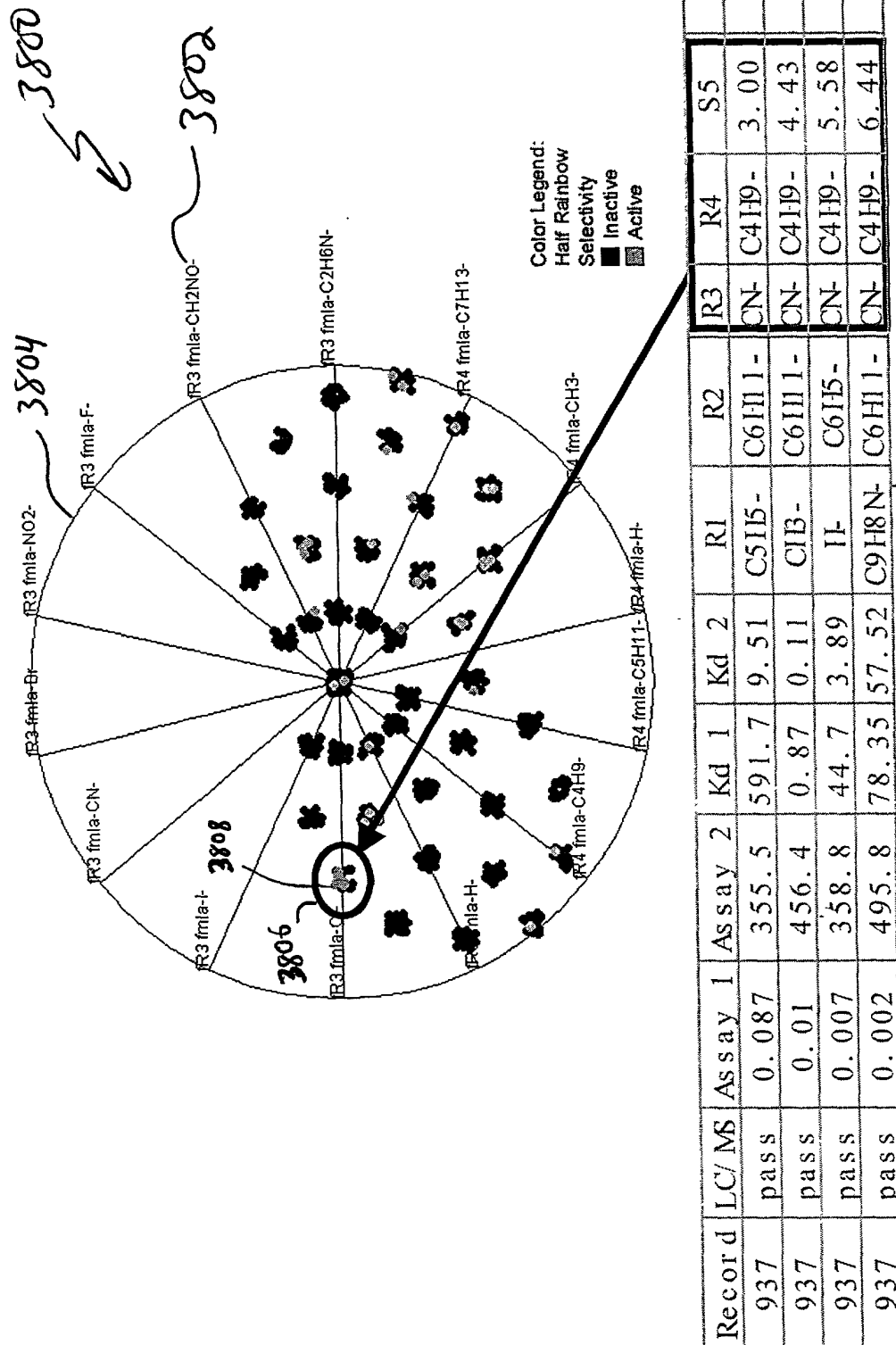


Figure 39

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# Radial Visualization Showing $R_3$ , $R_4$ & $S_5$ Attributes

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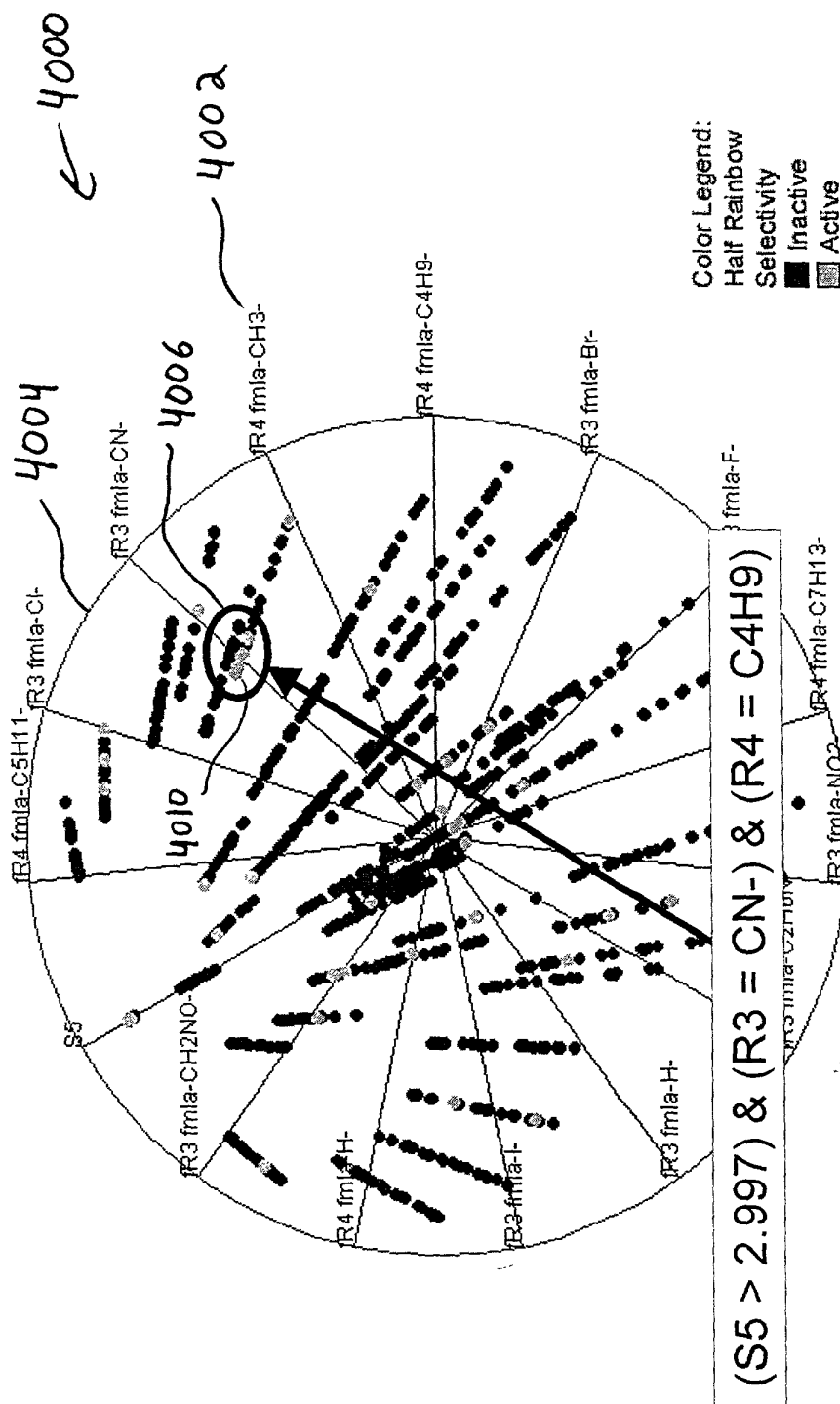


Figure 40

2273661

205420-16922007

# Radial Visualization Showing R<sub>3</sub>, R<sub>4</sub> & S<sub>5</sub> Attributes

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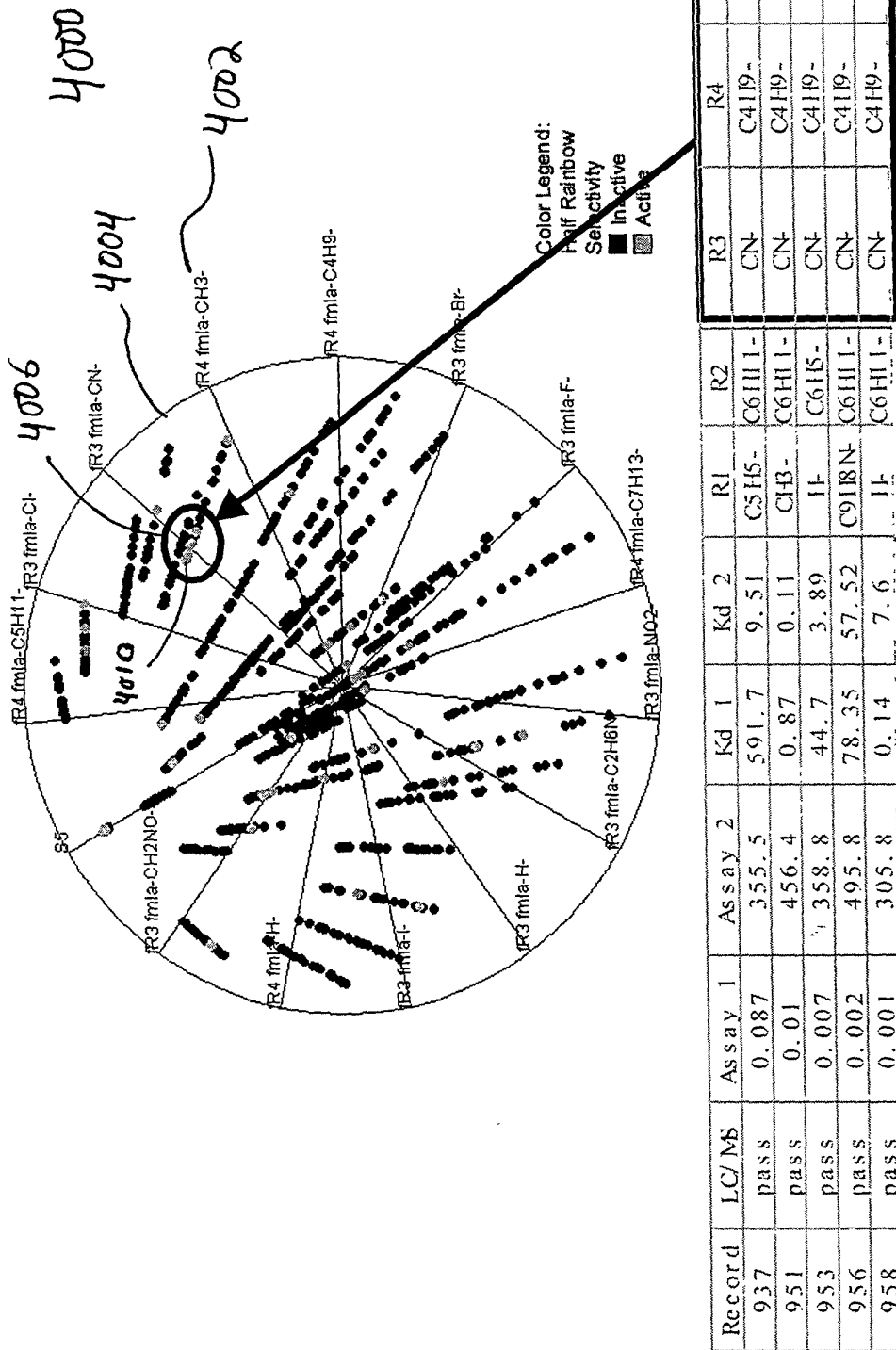


Figure 41

4008

2273661

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# Pearson Cross Correlations

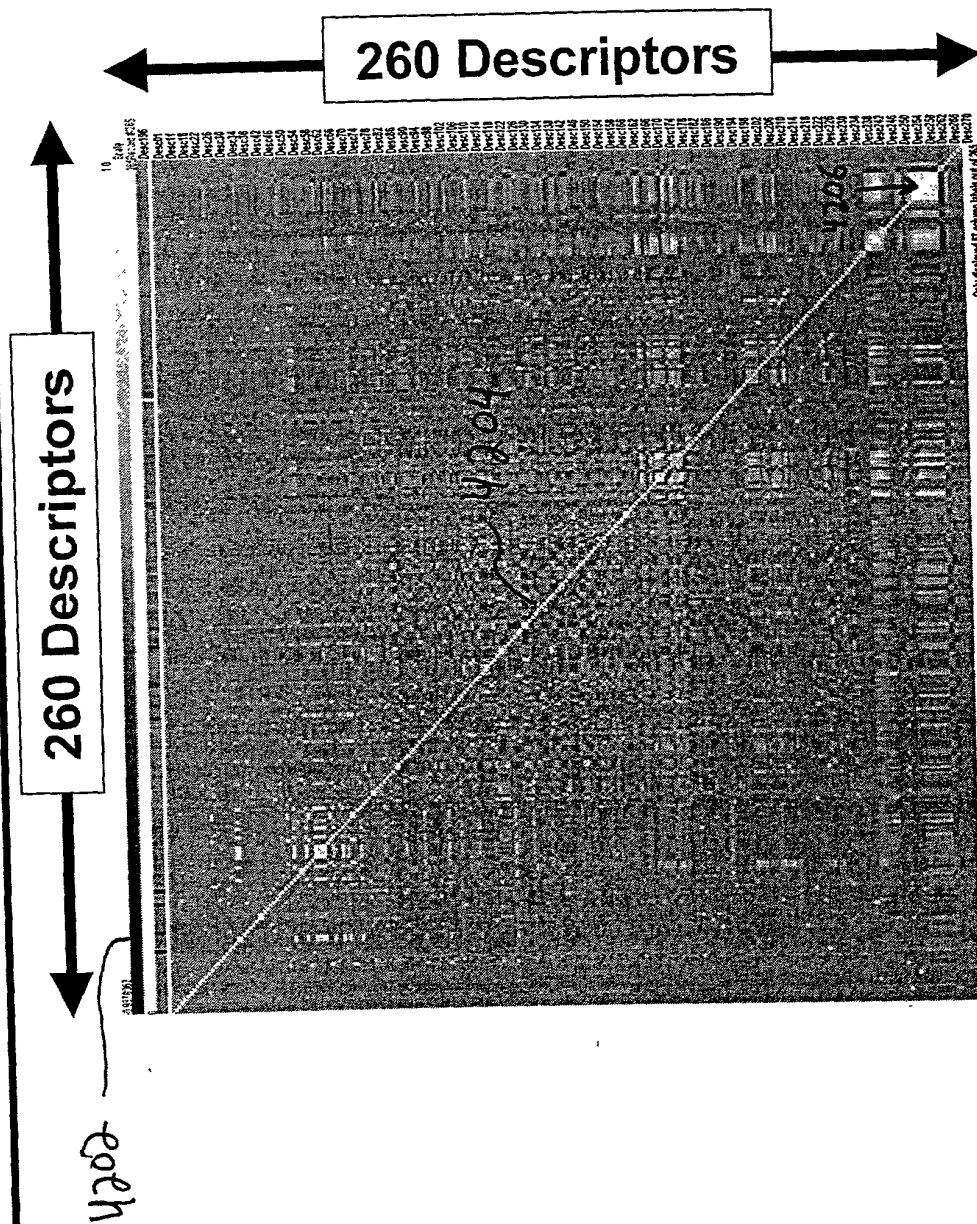


Figure 42

2273661

205120" 4692001

# ISIS Keys

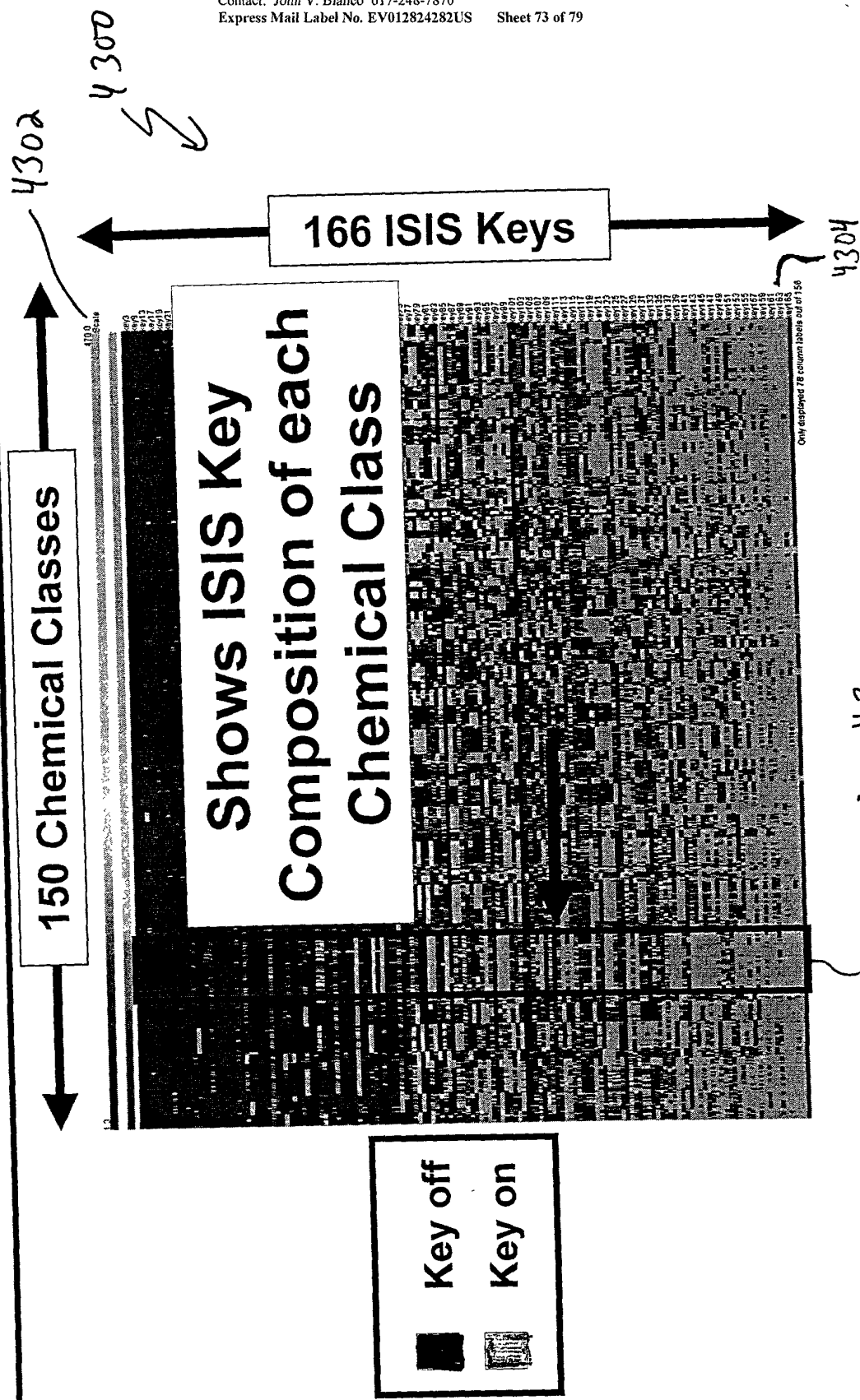


Figure 43

4306

2273661

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# ISIS Keys

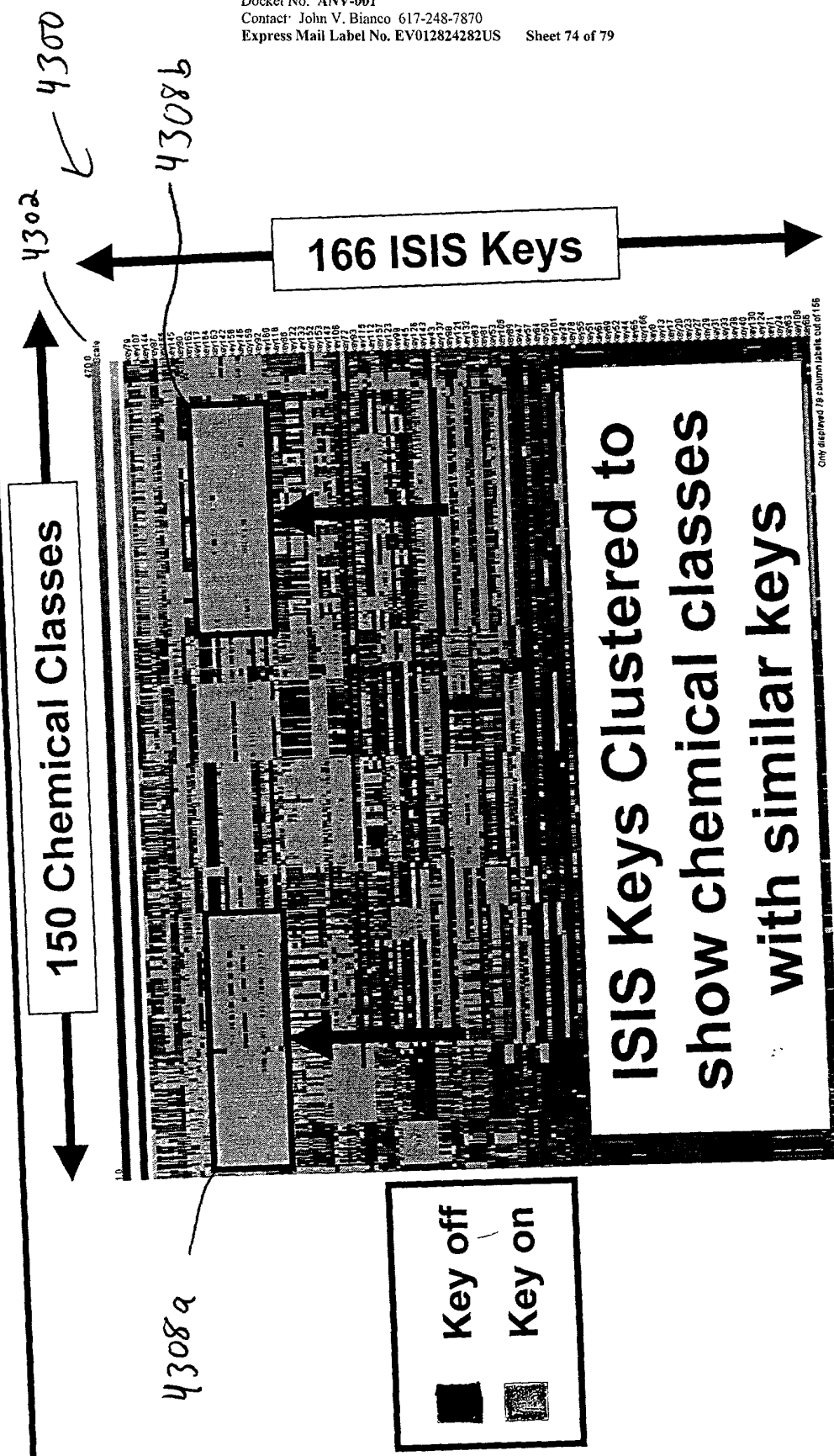


Figure 44

2273661

205F20-4694200T

# Association Rules - Visually

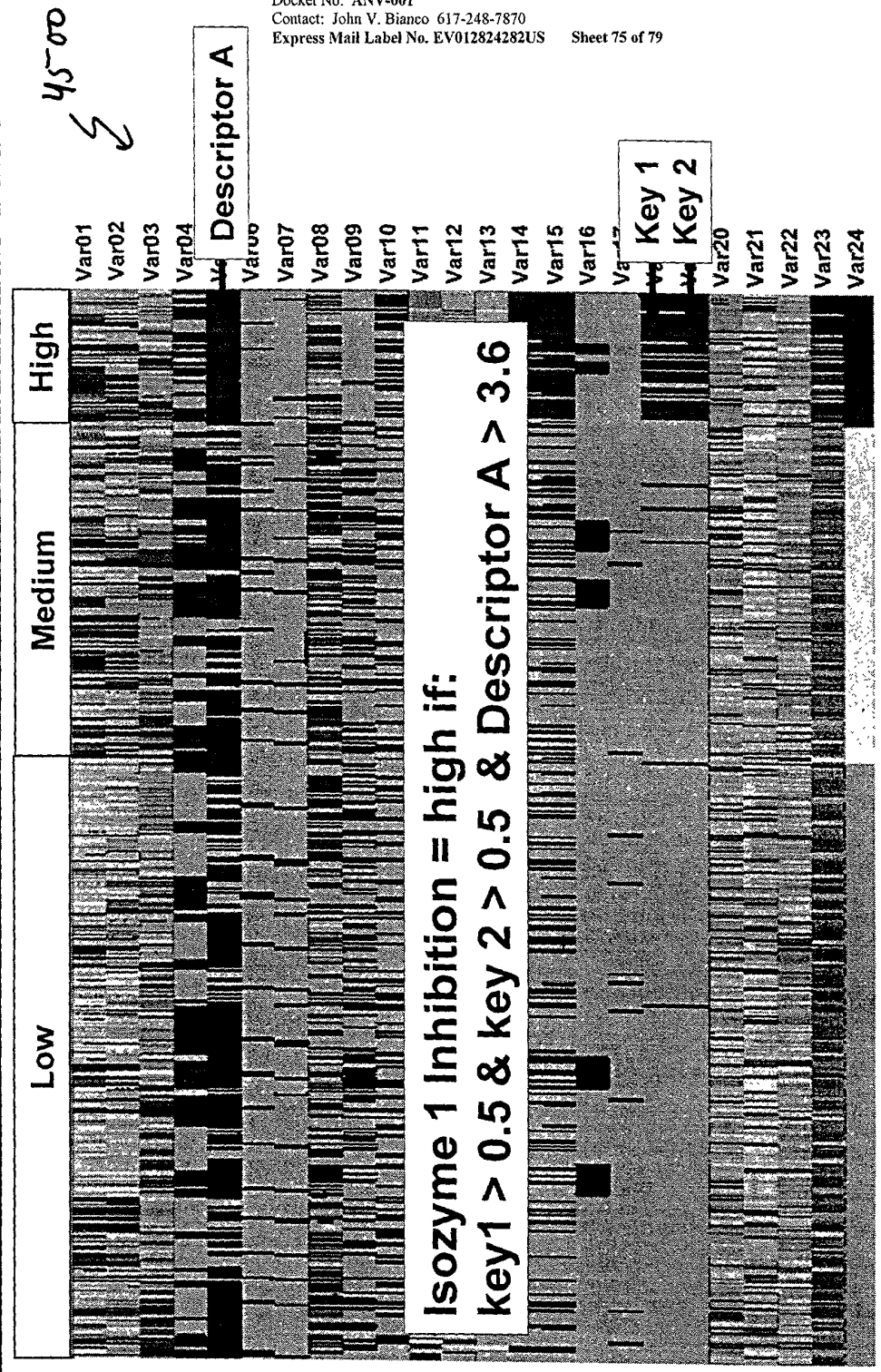


Figure 45

2273661

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# Exploratory Overview

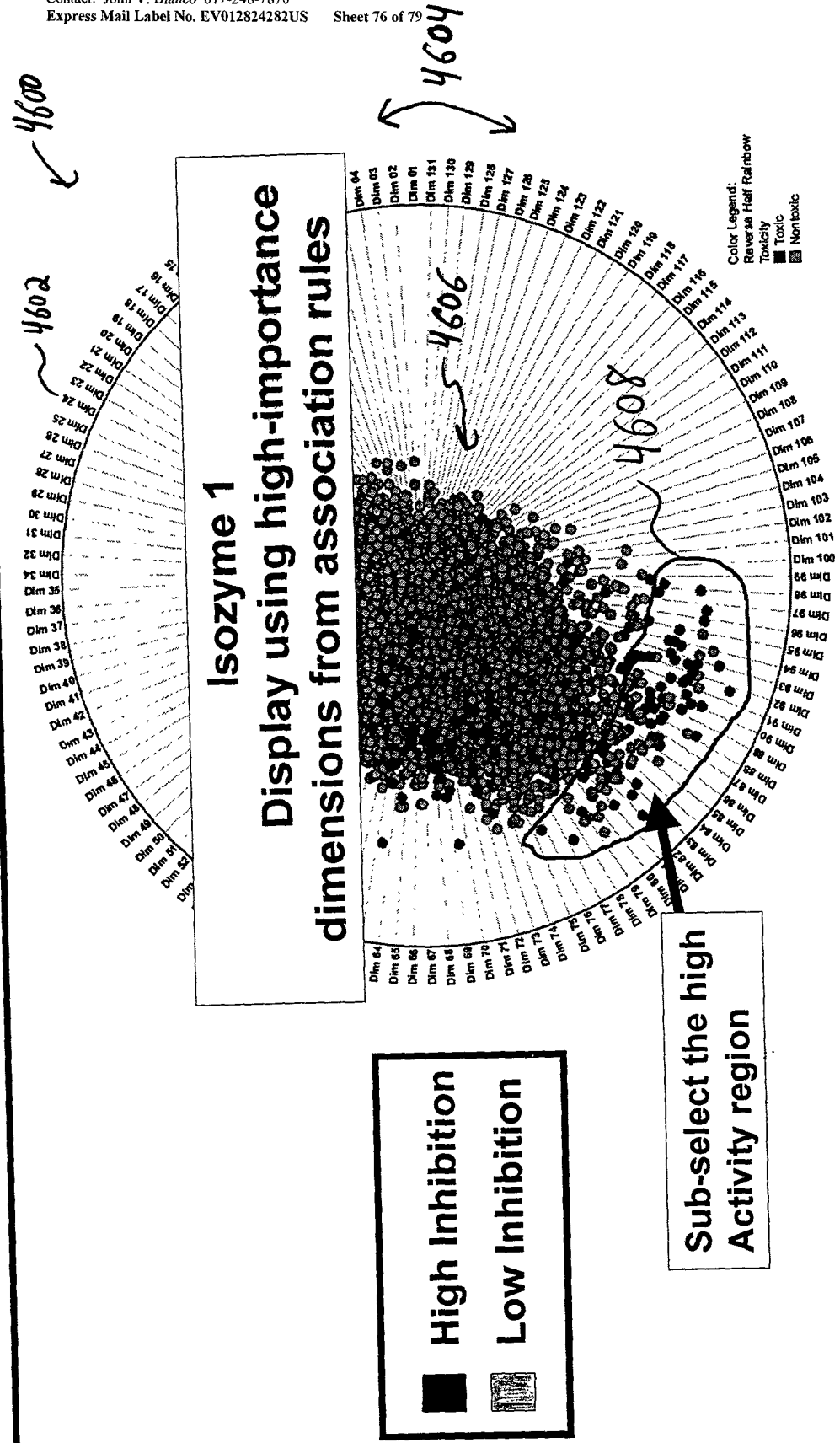


Figure 46

228 4985-1

4700 4702 4704

# Toxic Distinction

4700

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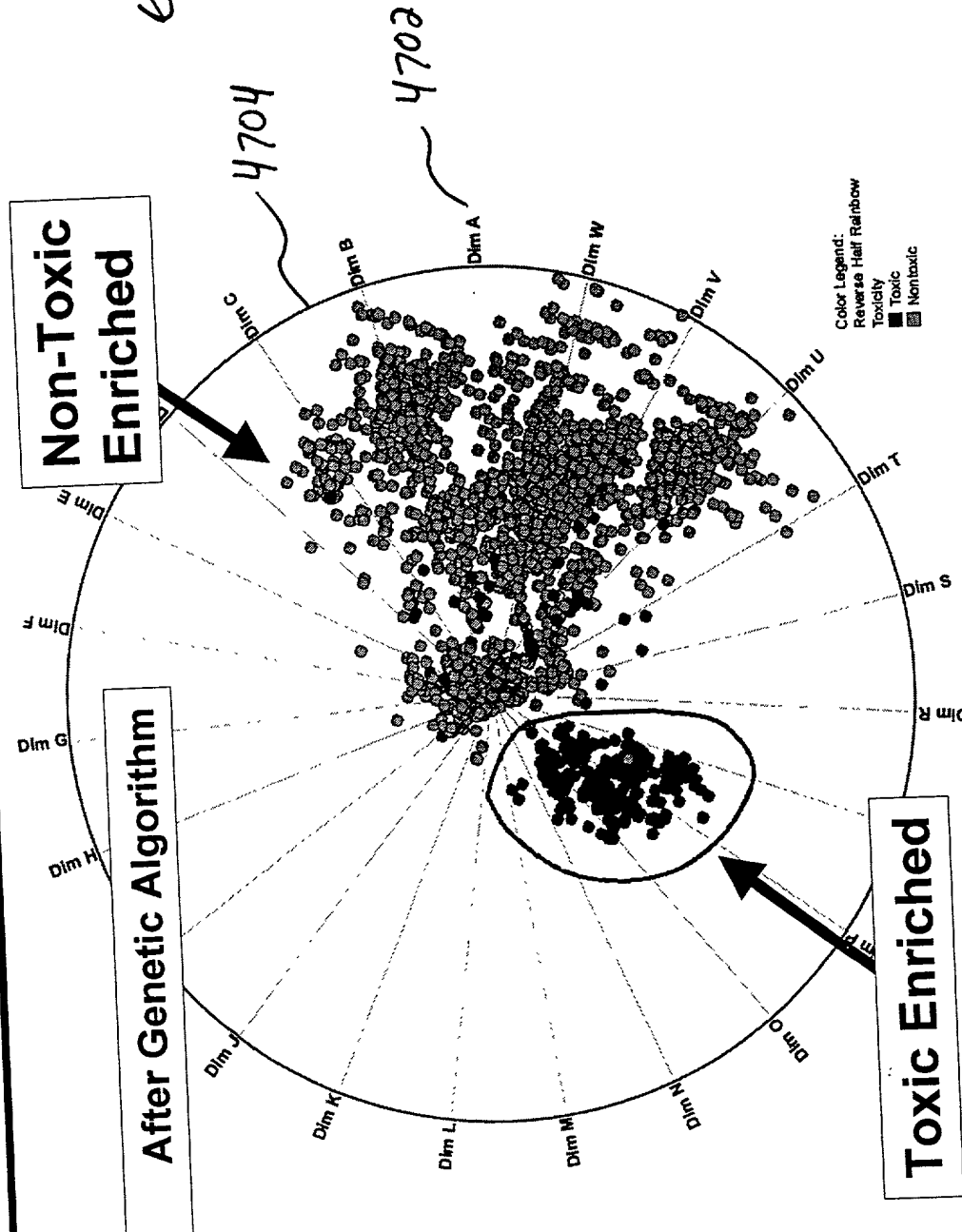


Figure 47

2284985

2005F20-469200T

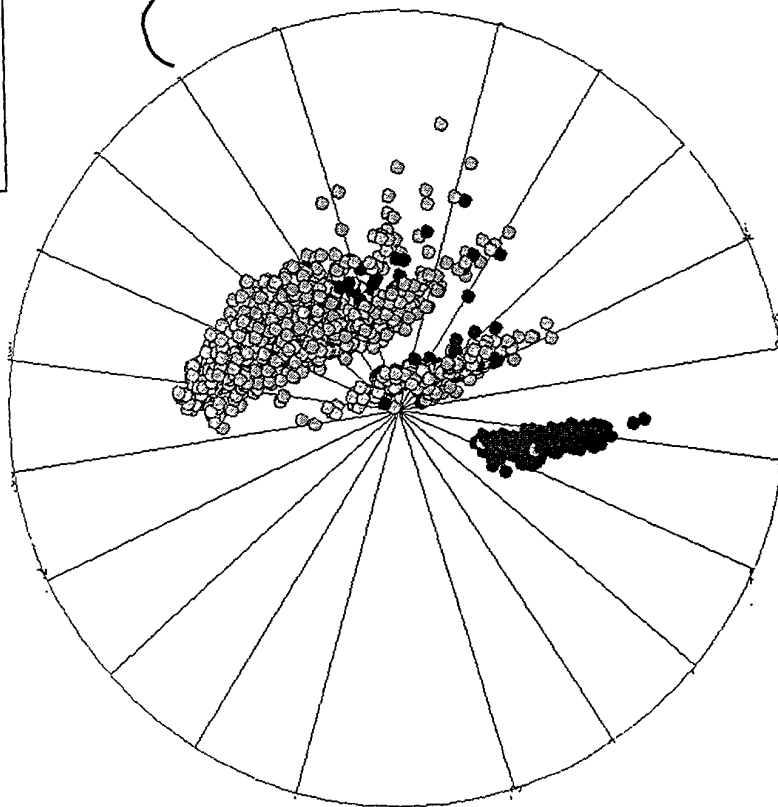
# Toxic Distinction

After AP Algorithm

4800



4802



Color Legend  
Half Rainbow  
● Non-Toxic  
● Toxic

Figure 48

2073661

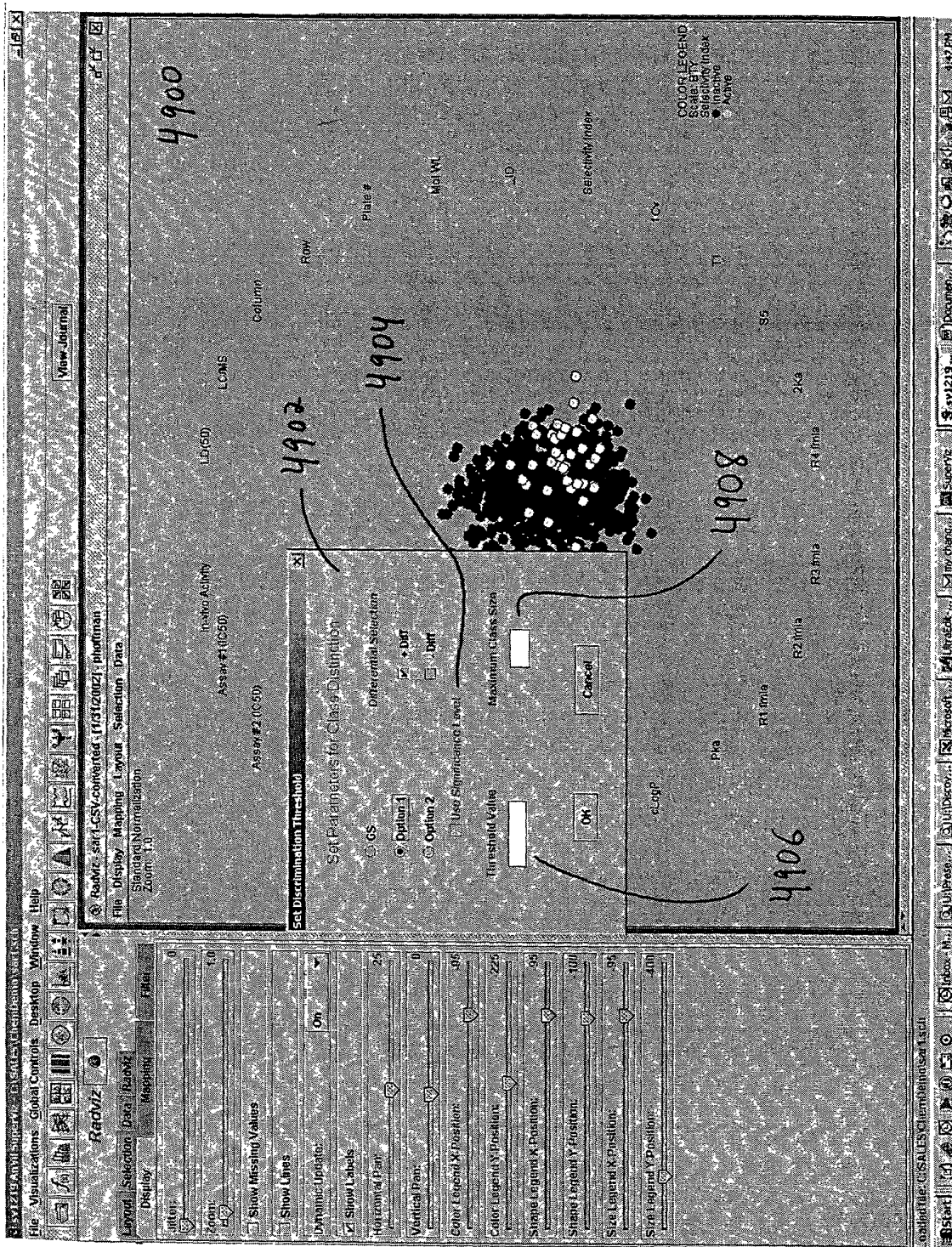


Figure 49